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Participation and Pressure in the Mist Kingdom of Sumba, A Local NGO's Approach to Tree-Planting

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ERRATA

On page 28 the sentence reading, "In Haiti, planners of a tree-planting scheme adhered to the suggestions of Chambers *et al* with extraordinary results..." should read, "Haiti's experience has been consistent with the model later described by Chambers *et al*."

Table 5.1 on page 139 tallies the total number of households in specific villages that have adopted particular YTN technologies, as reported in YTN annual reports. These reports do not define exactly what constitutes "adoption". Empirical observation, however, reveals that YTN's definition of "adoption" is very broad. YTN extensionists encountered in the field considered farmers to be adopters of their technologies as soon as they had received and planted on their holdings some quantity of seedlings from YTN or perhaps received seed for germination. Farmers need only receive a small number of seedlings and may plant them on just a small portion of their land. Maintenance of these trees could be minimal and a farmer would still be considered an "adopter" even if most of the trees provided died after the first planting season. In being seen as an "adopter" success is less important than a willingness to receive advice and materials from YTN, be they in small quantities. Figures in YTN's annual report depend on data provided by these extensionists.

NAME AND DESCRIPTION OF MAIN PLANTS PROVIDED BY YTN

Common Name	Scientific Name	Description
Multipurpose legumes, used in hedgerows		
Red Calliandra	*Calliandra calothyrsus*	Evergreen shrub: fast growing, to a height of 8m. Stem: erect, slender, branching, dark brown bark. Leaves: dark green. Flowers: red, profuse.
Gamal	*Gliricidia sepium*	Evergreen tree: grows to 10m, spread of 3m. Stem: erect & branching. Leaves: compound, 8-14 leaflets, 7cm long. Flowers: pink & yellow, pea shaped occurring in 10cm long racemes. Fruit: woody pods, 15cm long.
White Calliandra	*Calliandra tetragona*	Evergreen shrub: fast growing, to a height of 5m. Stem: erect, slender, branching. Leaves: green, fern-like. Flowers: white, tassel-like balls.
Flemingia	*Flemingia macrophylla*	Evergreen shrub: grows to 3m.
Horticultural trees		
Rambutan	*Nephelium lappaceum*	Evergreen tree: grows to 15m, spread of 3m. Stem: erect & branching, rounded crown. Leaves: leathery, green, bay-like, 15cm long. Flowers: white, small, occurring in dense clusters. Fruit: spiny, green, tinged with red berries, 5cm across.
Mango	*Mangifera indica*	Evergreen tree: grows to 30m, spread of 5m. Stem: erect & stout, spreading branches and densely textured crown. Leaves: dark green, lanceolate, prominently veined & 35cm long. Flowers: yellowish or reddish, 5 petalled & perfumed occurring in panicles. Fruit: yellow or red, ovoid drupes, 20cm long.
Cinnamon	*Cinnamomum zeylanicum*	Evergreen tree: grows to 10m, spread of 4m. Stem: erect, pale brown bark and angular branches. Leaves: leathery, opposite lanceolate, ovate & prominently veined. Flowers: small & yellowish with a tubular corolla & 6 wide lobes, occurring in axillary & terminal panicles. Fruit: berries, turning black when ripe, each containing a solitary seed.
Salak	*Zalacca edulis*	Evergreen shrub: grows to 2m. Stem: branched. Leaves: multiple, pinnate fronds, spined, extending from short stem, long to 2m. Fruit: brown, spiny skin, one seed, grow in clusters.
Guava	*Psidium guajava*	Evergreen tree: grows to 8m, spread of 3m. Stem: slender, erect & branching with dark brown, scaly bark. Leaves: green, oval to oblong, leathery, conspicuously veined, opposite & short petioled. Flowers, white 5 petalled & open, occurring in the leaf axils. Fruit: yellow, round berries, with calyx lobes at the apex.
Avocado	*Persea americana*	Evergreen tree: grows to 20m, spread of 5m. Stem: erect & columnar, spreading crown. Leaves: entire, elliptical or lanceolate-acuminate, leathery, prominently veined & short petioled. Flowers: small, greenish & 4 petalled, occurring in dense terminal panicles. Fruit: large, fleshy & pear-shaped with green rind & large bipartite seed.
Durian	*Durio zibethinus*	Evergreen tree: grows to 7m, with spread of 3m. Stem: stout, erect, branching, with dark brown, rough bark. Leaves: oblong, acuminate, prominently veined & dark green, yellowish brown undersurface. Flowers: creamy, yellow, bell shaped pendant & 5 petalled, occurring in clusters
Estate crops and trees		
Coffee	*Coffea arabica & C. robusta*	Evergreen shrub: grows to 3m, spread of 3m. Stem: slender with flexible spreading branches. Leaves: glossy green, oblong, acuminate, opposite & prominently veined. Flowers: white, 5 petalled & fragrant, occurring in clusters in the leaf axils. Fruit: red drupes, containing 2 seeds.
Cocoa	*Theobroma cacao*	Evergreen tree: grows to 8m, spread of 3m. Stem: erect & branching, mottled bark, densely textured crown. Leaves: glossy, green, alternate, petioled, oblong. Flowers: white or pink, small, deeply divided calyx & sessile. Fruit: brownish, red berries, ovoid & ribbed.
Vanilla	*Vanilla fragrens*	Climbing vine. Leaves: oval to heart-shaped, pale green. Flowers: orchid like, followed by pods.

Wounded by the jagged ugliness of reality
I chose cynicism to numb the pain rupturing my conscience,
But the medicine was bitter; indeed worse than the disease.

This thesis is dedicated to your vibrant flame of hope and optimism.

Perhaps I shall never have it, but in you I felt it
And when chilled by hypocrisy and contradiction,
Your memory warms my heart.

ABSTRACT

This study was a response to suggestions that tree-planting systems promoted by non-government organisations (NGOs) were highly appropriate methods of facilitating the physical and human development of upland, subsistence farmers. These suggestions have been based on two premises: first, that participatory approaches are the most effective means of implementing tree-planting and second, that NGOs are most experienced with and suited to using these approaches. A case study in East Sumba, in the Indonesian province of East Nusa Tenggara, examined a local NGO promoting tree-planting via a participatory approach. The NGO observed, Yayasan Tananua, had been exalted as one of the province's most successful and had been forwarded as a model to which other NGOs, within and outside of the province, should aspire. The study analysed the type of participation that this NGO (which aimed at enhancing participation) was using. It also assessed the effectiveness of the NGO's participatory approach in encouraging subsistence farmers to adopt tree-planting, given other constraints to adoption that have traditionally plagued these systems (especially economic, policy and socio-cultural factors).

It was found that the degree of recipient participation in the approach was low and that the agency was unable to encourage high quality adoption of tree-planting by farmers. The participatory approach had been replaced by one relying on pressure and force to coerce adoption. Force primarily emanated from government officials and members of the traditional elite. However, its emergence was contributed to by the NGO because of their emphasis on collaboration with the state and traditional leaders. Use of force by these groups was also tolerated by individual NGO staff interested in sustaining high rates of adoption. This desire emerged from perceived pressure on the agency originating from the expectations of donors and scrutiny of its activities by peer NGOs in a highly competitive environment. Conclusions refer to the actual freedom of NGOs from policy and financial ties, their ability to achieve institutional reform via collaboration with state agencies and the validity of using participatory approaches to promote preconceived technologies. Recommendations are generated for the NGO studied and the possibility put forward of combining participation and pressure in a single development approach.

DECLARATION

I, Justin Lee, declare that this thesis contains no material which has been accepted for the award of any other degree or diploma in any University and that, to the best of my knowledge and belief, the thesis contains no material previously published or written by another person, except where due reference is made in the text of the thesis.

I consent to this thesis being made available for photocopying and loan if applicable if accepted for the award of the degree.

Date: 11 / 11 / 95

(Justin Lee)

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GLOSSARY

BANGDES	*Badan Pembangunan Desa*, Village Development Office
BAPPEDA	*Badan Perencanaan Pembangunan Daerah*, Planning Arm of the provincial government, also has offices at the regional level.
CUSO	Canadian University Students Overseas, North American NGO commencing direct funding to YTN.
Desa	Village, indicating an administratively distinct group of communities.
DPRD	*Dewan Perwakilan Rakyat Daerah*, Provincial level of the People's Assembly
Dusun	Community, level of village administration.
Ford Foundation	North American NGO that provides indirect funding to YTN via the Nusa Tenggara Uplands Development Consortium (network of NGO's in NTT).
GEMPAR	*Gerakan Meningkatkan Pendapatan Asli Rakyat*, Province wide programme to raise the incomes of local people.
GORA	*Gogo rencah*, Province wide programme promoting a system of early rice planting, involving the cultivation of land before the beginning of the wet season.
Hak milik	Strongest title to land, under the Indonesian system of land title. In the villages of Sumba most land has not been formally certified. *Hak milik* in the Sumba context, is thus referred to as 'certifiable land' that individuals could possess entirely but which has not yet been formally recognised.
ILEIA	International NGO, based in the Netherlands
KUD	*Koperasi Unit Desa*, Village cooperative supported by the government.
NGO	Non-government organisation
NTT	*Nusa Tenggara Timur*, Province of East Nusa Tenggara
OPSUS	*Operasi Khusus Pahamu Nduma Luri*, Special operation, occuring at the regency level of East Sumba, to improve rural livelihoods.
OXFAM (UK)	International development NGO, based in the UK
PKK	*Pembinaan Kesejahteraan Keluarga,* government-sponsored institution entrusted with guiding family welfare at the village level.
RK (or RW)	*Rukun Kelompok* (formerly *Rukun Wilayah*); hamlet, level of village administration.
Rp	*Rupiah*; Indonesian currency, Rp 2140 equalled one US dollar at the time of data collection.

RT	*Rukun Tetangga;* neighbourhood, lowest level of village administration.
SOSPOL	*Kantor Sosial Politik*, Branch of the Indonesian government attending to socio-political security.
Unitarian Service Committee	International NGO
WALHI	*Walhana Lingkungan Hidup*, Indonesian environmental NGO operating at the national level.
WN	World Neighbours, North American NGO which is YTN's parent organisation and major source of funds.
World Education	International development NGO
WWF	World Wide Fund for Nature, environmental NGO.
YTN	*Yayasan Tana Nua*, local NGO working in East Sumba.

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There is nothing in the world harder than straightforwardness, and nothing easier than flattery. In straightforwarward dealing if there is one-hundredth of a false note, the result is immediate dissonance and, in consequence, trouble. But in flattery every single note can be false and the effect will be agreeable.

Svidrigaylov in Dostoyevsky 1866

This study's overt analysis has been accused of taking the easy road of excessive criticism. Indulgence of this type however, was not my purpose and it has not been easy to make those statements that have been interpreted as inordinate criticism. To accurately tell my version of the story has been extremely difficult. It has meant stretching and losing friendships, reduced opportunities and attacks on my credibility. However, I must tell it as I see it. I would rather contribute one piece of work that nears the truth than complete one hundred written for political correctness and acceptance. Moreover, I have not wanted to be either patronising or paternalistic. Instead it has been my intent to subject the people who are the focus of this research to critical and rigorous analysis. Perhaps this is unfair, however, I do it with the full knowledge that the Sumbanese demand no sympathy nor concessions. They are strong people who have survived to take their place in the twentieth century through hard work and resilience. Open discussion about what is occurring in their homeland, rather than harming them, can only strengthen their resolve.

Field based studies are highly dependent upon the goodness and hospitality of the people in the study area. I am indebted to all residents of the villages of Praimbana, Praibokul, Meorumba, Wanggameti, Katikuwai, Katikutana and Ramuk who received us in their homes and spoke with both candour and courage.

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PREFACE

Watching the rain, they find no course beyond
The skim and random scattering of sound;
Walking with care, they only gain
What sight one footstep gives of ground.

R. McDonald, *Citizens of Mist*

The modern Indonesian district of Paberiwai encompasses the central highlands and tallest peaks of East Sumba. Like most districts in this regency, Paberiwai's borders closely follow the historical boundaries of one of Sumba's traditional Kingdoms. Hence, Paberiwai's inhabitants can still be heard to refer to their mountainous homeland as "Kerajaan Mahu". Translated from the Kambera language, this means "Mist Kingdom". Although "Paberiwai" is an appropriate name for the district, referring to its essential role in catching and distributing much of the island's water supply, it is "Mahu" that accurately conveys the feelings of impenetrability, mystery and awe that this land inspires.

Around mid-afternoon, Mahu's most elevated village, Wanggameti, is blanketed by a thick mist, blown up from the lowland valley of Karera. Light fades and it becomes impossible to distinguish earth from sky, forest from grassland. It is perhaps this almost daily dry-season phenomenon that gave the Kingdom its name. However, it is not only the mist that is impermeable in Mahu, nor just the horizon that is indistinguishable. For the Kingdom's mountainous terrain and inaccessibility has long been used by the people of Mahu (*Tau Mahu*) and their allies for concealment and fortification and to generate myths that would both enhance their reputations and protect them from outsiders. Just as the rolling mists have closed over the mountains, the mist and the mountains together have concealed and guarded the *Tau Mahu*.

History provides many illustrations of the protection offered by Mahu's terrain to its inhabitants. For much of the eighteenth and nineteenth centuries Sumba was terrorized by roving bands of Endenese slave traders from Flores. Due to Mahu's steep slopes and inaccessibility, it was the only Kingdom to successfully deter these attacks and never lose citizens to slavery. In addition, Mahu has traditionally been a place of refuge for those of other Kingdoms. The royal family of Kadumbulu, whose lands fell in the greater Kingdom of Lewa-Kambera, moved to Meorumba in Mahu to escape attacks from Endenese and Savunese. Similarly, at the beginning of this century, one of Lewa-Kambera's most famous Kings, Umbu Biditau, hid in Mahu for a short time to escape the Dutch. As well as offering physical protection, the inability of outsiders to penetrate Mahu has allowed its people to generate a fearful reputation, especially in neighbouring Karera. The *Tau Mahu* traditionally conducted raids from their mountain top hideouts on Karera's lowland settlements. The *Tau Mahu* have also been able to place many myths in the minds of their foes. One of the renowned myths surrounding the Kingdom includes the belief that it contains, in the Kaba Au mountain range, one of Sumba Island's two 'heavens', or places on earth where the dead congregate. The Kingdom is also noted for its many 'haunted' forests.

In the 1990s, fifty years after the Republic of Indonesia was declared, little has changed for the *Tau Mahu* as new forces threaten to drag them from their mountainous homeland. These pressures emanate from the Indonesian Government's national programme of development and modernisation, which asserts that people in isolated regions, such as Mahu, must be resettled to more easily serviced lowland areas, for their own welfare. For the *Tau Mahu* however, this resettlement under the banner of development is like the slavery of the past. It takes them from the mountains that have supported and protected them and which are the resting places of their ancestors. By doing this, it jeopardises the material and spiritual pillars of their livelihood.

In the face of these pressures, many in Mahu have realised that they may be able to stay in their mountains if they can improve their existing livelihood system, thereby making

relocation unnecessary. An avenue to achieve this has been provided by a tree-planting and agricultural intensification project funded by a North American non-government organisation (NGO) and implemented by a local NGO. All accounts to date, suggest that this programme has been highly successful, increasing living standards and conserving Mahu's environment. Consequently the tenure of the *Tau Mahu* over their traditional lands has been strengthened. The NGOs which instituted the programme have also benefitted, enhancing their institutional reputation and the status of their development approach and preferred technologies.

However, it is possible that the real benefit for the *Tau Mahu* has not come from their involvement in the NGO programme, but from Mahu's terrain itself, which has again assisted the blurring of myth and reality to protect the Kingdom's people. For the *Tau Mahu* it has been crucial that this programme is, or is at least seen to be, successful. Regardless of the programme's actual achievements, the *Tau Mahu* have been assisted in creating an image of success by the Kingdom's physical conditions. Mahu's inhospitable terrain has made it extremely difficult for assessors of the programme to reach a firm conclusion based on their own observations. With Mahu's mountains impairing the vision of assessors, restricting them to those sites which are within their walking range, they have become highly dependent on the sounds (or discourse) of Mahu's farmers themselves. It is possibly the case that the deception provided by Mahu's physical environment was then completed by assessors' own willingness to rely upon these representations. The objectivity of outsiders is often blurred by a wish to trust their hosts, to avoid offence and gain acceptance. The discourse of local people can also be appealing to outsiders if the former carefully construct compliments that reinforce outsiders' preferred paradigms. This tendency of outsiders towards mystification has thus assisted the *Tau Mahu* in both historical and contemporary times.

In the Mist Kingdom of Sumba it has always been difficult to distinguish myth from reality. To view the whole context in which events occur there are innumerable barriers to overcome. Hence, it is easier to rely on the sounds made by those resident in the Kingdom. To date reliance on these sources has led to an NGO's programme being upheld as a saviour of

these mountain people; but is this realistic? Should the discourse of local people be trusted without the aid of intensive, critical observations? There is a balance to be achieved between being polite and being patronising and it must be acknowledged that every party has vested interests and makes statements from their own subjective positions. No doubt many *Tau Mahu* have put much effort into making the programme a success but it is also essential for them to avoid resettlement. Similarly, NGO staff and assessors only have the best interests of recipients at heart, but it is also crucial for them to strengthen their claims to service provision contracts by proving their ability to use popular approaches, such as participation. The truth can only be known by entering the mist, so that the sounds that are heard can be verified with what is actually visible.

Overview

The first two chapters of this dissertation establish, from the literature, reasons for the emerging popularity of tree-planting systems, factors constraining their adoption and the sort of approach most likely to overcome these limitations. Chapter 1 defines tree-planting systems believed to contribute to development; particularly of people engaged in shifting cultivation. It also establishes the bases of these systems' popularity. This rests on their consistency with the now accepted concepts of **sustainable development** and **appropriate technology** and also their economic and environmental advantages in the field. However, despite the alleged advantages of tree-planting activities, constraints to their adoption have arisen. The most important of these constraints are investigated. Chapter 2 asserts that a **participatory approach** to the promotion of tree-planting is believed most likely to overcome these limitations and finds that NGOs are currently perceived to be the agencies best suited to implementing this approach.

Chapter 3 details the objectives and methodology of a case study describing a local NGO which has attempted to use a participatory approach in practice, in the East Sumba regency of East Nusa Tenggara Province, Indonesia.

Chapters 4 to 7 present and discuss the results of this case study. Having described the NGO's working environment, organisation and programme structure in Chapter 4, emphasis turns in Chapter 5 to a detailed analysis of the agency's ability to encourage participation when implementing its programme. It is observed that there is minimal participation. By examining the NGO's motives, it is argued that participation has been excluded because of a pre-existing desire by the local organisation and its donors to promote a particular technology throughout the region, regardless of variations in location and recipient desire. To determine the importance of a participatory approach to the reception of tree-planting innovations, Chapter 6 examines the quality of adoption in the absence of significant participation. A finding that the NGO's most promoted technology has been adopted in a low quality manner, prevents the dismissal of participation as an important component of recipient motivation. Chapter 7 examines from a farmer's perspective the reasons why many local people have followed the programme in a token manner without engaging in high quality adoption. In participation's absence, the existence of force and pressure is uncovered. It is established that all parties have a political interest in creating an image that the technology has been successfully adopted. This is even though the technology, as initally and persistently promoted, has not noticeably improved farmers' livelihoods.

Chapter 8, the conclusion, summarises what has been learnt about the role of NGOs in the development process and raises the possiblity of a development approach combining participation and pressure.

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CHAPTER 1

TREE-PLANTING FOR DEVELOPMENT: CONCEPT AND CONSTRAINTS

1.1 General need for tree-planting activities

The need to plant trees in a wide variety of environments throughout the world is now a popular belief among numerous theorists and agencies. The focus here is on the suggested need for tree-planting in upland tropical regions with semi-arid to sub-humid climates. Of particular interest are rural areas in developing countries with high proportions of subsistence or near-subsistence farmers.

Currently, shifting cultivation continues to be the predominant agricultural system by which people in these areas maintain subsistence. It has been argued however, that under population pressure, shifting cultivation breaks down. A continually increasing population and the extensive nature of the cultivation system means that eventually there is a lack of new land to open, fallow periods are shortened and the forest is not permitted to regenerate. This results in erosion, a decline in soil fertility and crop yields and consequently a reduced human carrying capacity (Kunstadter and Chapman 1978: 3, Davidson 1987: xix, Hardjono 1991b: 3, Allen 1993: 227, Lian 1993: 331). Metzner (1982: 57) asserts that shifting cultivators are loathe to intensify their practices while there is still new land that can be opened and cultivated. This means deforestation and land degradation are necessary outcomes of the system. It has been suggested that the demands for land by shifting cultivators in general, are such that in 1984, 45 percent of all tropical deforestation was due to agricultural expansion by slash and burn (Wiersum 1984: 14).

However, accusations attributing responsibility for deforestation to shifting cultivators should be treated with caution. The role of shifting cultivators in degrading the forests of Indonesia, especially in areas like Kalimantan, is often inflated. While not denying that they contribute to degradation, it is said that other users, such as loggers, appear to do more damage. Often responsibility is placed on shifting cultivators, especially traditional ones, for political reasons, to justify their resettlement and consequent dispossession of the forest resource (Potter 1991, Dauvergne 1994). Brookfield and Padoch (1994) demand more balance in the assessment of shifting cultivation systems. They say that determining who is responsible for the degradation of forests and forest lands is complex and cannot be blamed entirely on shifting cultivators' inability to overcome rising population pressure. Moreover, they assert that there are many types of shifting cultivation and no one universal system. Although some forms of the activity are degrading in certain locations, there are many variations of the system, such as that of Machakos in Kenya (described by Brookfield and Padoch 1994: 38), which have overcome internal pressures and avoided degradation. Rather than condemning all shifting cultivation systems, they recommend focussing efforts on the assessment of which systems resist internal pressures and which do not. Therefore, while environmental damage from shifting cultivation may be significant, estimates as to the extent of damage should be received conservatively. Moreover, this damage should not justify condemnation of all variations of the cultivation method.

Nevertheless, despite calls for greater objectivity in the assessment of shifting cultivation, decision makers continue to believe that many derivations of the system have problems which demand action. Popular solutions to the perceived problem of shifting cultivation in upland areas include resettlement of farmers out of heavily sloping areas, reforestation of degraded sites, provision to farmers of off-farm employment and intensification of agricultural practices. Resettlement normally involves moving shifting cultivators out of sloping areas to more central locations where they can be more easily serviced and where they

will no longer damage fragile uplands.[1] Such schemes however, create social upheaval, facilitate the use and degradation of forest areas by other users and often threaten the subsistence of those relocated. Resettlement presents them with few new opportunities and the extensive method of agriculture familiar to them, cannot usually be sustained on the quickly fatigued lands of the resettlement sites. Similarly, Soemarwoto (1991: 220) has astutely argued that reforestation cannot by itself resolve the problem because the rate of reforestation cannot keep pace with that of deforestation. Even more importantly, farmers slash forest areas for land not forest products, a need which is not diminished by reforestation. Instead, they merely look for land in other places. Soemarwoto says that it is better to provide shifting cultivators with off-farm employment opportunities to reduce their dependence upon shifting cultivation for a livelihood. However, despite the opportunities that may be available in some areas if there is a logging industry, or if the population is prepared to be highly mobile, it is often very difficult for shifting cultivators to get off-farm employment in the short to medium term. They lack education and often live in peripheral areas that are unattractive to private investment. Such areas are dominated by agriculturalists all competing for the few opportunities available. The short term likelihood that people will continue to reside in the uplands and practice shifting cultivation has led to suggestions that improvement and intensification of the agricultural system should occur.

This scenario has prompted theorists and practitioners to argue that tree-planting systems would assist intensification of shifting cultivation in the uplands. These technologies are thought to increase farmer incomes and living standards while reducing pressure on forest products, stabilising the slopes and promoting sedentary cultivation, thereby reducing farmers' demands for land. It is these characteristics of tree-planting which Kaimowitz (1993: 1144) suggests are responsible for its burgeoning popularity: it assists farmers' livelihoods while remaining compatible with, and indeed enhancing the condition of, the environment. This makes tree-planting consistent with a central principle of **sustainable development** which asserts that

[1] Commonly used by the Indonesian Forestry Department via its transmigration and local transmigration programmes (Departemen Kehutanan 1990: 101).

activities must be compatible with ecological diversity and sustainable resource use (Thijs De La Court 1990: 136). In erodible, infertile and semi-arid uplands it is held that such functions cannot be achieved via intensification with shallow rooted annual crops (Simpson 1991: 12)

Tree-planting systems' consistency with the concept of **appropriate technology** also accounts for their popularity. Tree-planting systems have a number of characteristics making them appropriate for the improvement of rural livelihoods. After establishment they need few inputs, they can be small-scale and thus affordable by families and/or small groups, they are easily understood, controlled and maintained by villagers with little training, they enhance self reliance and they are suited to modification by locals in changing circumstances (these characteristics of appropriate technology are set out in Darrow and Saxenian 1986: 7).

1.2 Defining tree-planting systems suggested for improving upland agriculture

There is a wide array of tree-planting systems that have been suggested to intensify the practices of upland farmers, thereby improving their livelihoods while not degrading the natural environment. Any one tree-planting system can be identified by numerous criteria, including the agro-ecological zone in which the system occurs and the functions it performs. The two features used to describe tree-planting systems here, are the agroforestry technology they employ and second, their socio-economic scale and management level (these criteria are suggested by Nair 1989: 48).

The term 'agroforestry' is generally used to mean the growing of trees in combination or sequence with agricultural crops and/or livestock on the same unit of land, in a productive and sustainable farming system on smallholdings or large estates (Nair 1989: 14, Davidson 1987: 1). A genuine agroforestry technique must include significant interaction between the system's woody and non-woody components (Nair 1989: 17). There should also be greater species diversity than is normally found in other agricultural systems (Stoney and Bratamihardja

1990: 147). According to this definition, therefore, an activity is deemed to be agroforestry if its woody and non-woody components are in an approved structure and operate in a sufficiently interactive manner. This means that a system's agroforestry status is determined purely by its physical properties and not other aspects, such as the structure of management.

Agroforestry technologies are divided into three general types, agrisilvicultural systems combining agricultural crops with forestry activities, silvopastoral systems combining forestry with pasture or some other kind of feed for livestock and agrosilvopastoral systems which have forestry, agriculture and livestock components. In addition there are lesser, individual techniques which do not fit into the above categories. These include systems such as aquaforestry, which develops positive interactions between fish and forests and apiculture with bees. The following describes the structures of some of the more dominant systems found in and designed for the uplands of the semi-arid and sub-humid tropics.

1.2.1 Agrisilvicultural systems

a) Taungya system

The taungya system, which comes under a variety of other names, most notably *tumpangsari* in Indonesia, combines plantation timber trees with agricultural crops. Trees are usually spaced two metres apart and planted in rows three metres apart. Crops are grown in between these rows for approximately two to seven years until they are shaded out by the trees. This system constitutes agroforestry for the initial establishment phase after which it converts to a timber plantation only. In Kediri, Java, the Indonesian Government's State Forest Corporation (SFC) attempted to increase the agroforestry phase of this system by developing *integrated tumpangsari*. By experimenting with various tree spacings they found that they could increase the growing period of common agricultural crops such as corn, pineapple, chilli and elephant grass by increasing the row distance to four metres (SEAMEO BIOTROP 1990: 2-3).

They also diversified the outputs of the system by growing *Albizia* species and *Leucaena* species instead of using all high quality timber trees.[2]

b) Alleycropping

This technique is widely believed to be one of the most promising alternatives to, or means of intensifying, shifting cultivation (Handawella 1989, Aweto and Obe 1993). It involves growing trees in rows or strips and then in the alleys between these trees planting agricultural crops. Unlike the taungya system, intercropping continues indefinitely beyond the establishment phase. Instead of timber trees, fast growing tree legumes are planted which coppice vigorously and survive frequent cutting back. They are intended to complement agricultural activity rather than displace it in the long term. The leguminous trees are permitted to grow during the dry season thereby shading out weeds and contributing to soil fertility (Nair *et al* 1984: 153). In the planting season the trees are cut back so that there is sufficient light to grow annual crops. The prunings are used as cattle fodder and mulch and because the trees are not uprooted, only cut back, soil stability is maintained (Kang *et al* 1984: 7). The following dry season the trees are again left to grow.

c) Fuelwood production

This system involves interplanting trees suitable for use as fuelwood with the ordinary crops of the region on agricultural land. The trees are grown in various arrangements either in zones, strips or at the boundary (Nair 1989: 58). The symbiotic relationship between trees and crops is not emphasised in this system as it is in alleycropping. Emphasis is merely on utilising excess space to grow fuelwood.

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[2] The origin of the taungya system in Burma in the mid-nineteenth century is discussed by Bryant (1994). Its history in Africa and Indonesia is outlined by Goswami (1988) and Sediono (1987) respectively. The general terms and conditions of the system are contained in King (1988), and a more critical perspective of the system's operation and motivations is provided by Peluso *et al* (1990) and Peluso (1992).

d) Shelterbelts, windbreaks, soil conservation hedges

By planting two rows of trees along the windward boundary of a farm, agriculturalists can improve crop yields and grow firewood and/or fodder (Pereira 1989: 103). The most suitable trees are tall, spreading types and they should be planted so that they break the wind's force by stopping 50 percent of it from passing. This form of agroforestry is particularly important in regions with long dry seasons and hot dry season winds (Pereira 1989: 103).

e) Multipurpose trees and shrubs on farmland

This system involves the growing of multipurpose trees, most often fruit trees, on the same land with agricultural crops. Trees may be scattered haphazardly throughout the field or planted in a systematic pattern either on bunds, terraces or along boundaries (Nair 1989: 57). As in agroforestry for fuelwood production the relationship between the crops and the trees is not great but the harvesting of tree products significantly improves crop diversity and therefore, improves the security of subsistence practices. This system is also commonly integrated with animals.

1.2.2 Silvopastoral systems

a) Cut and carry fodder production

This is similar to systems growing fuelwood or fruit trees on agricultural land except that the trees are intended for livestock fodder. There are many variations but usually leguminous fodder trees are used. In the Amarasi region of West Timor farmers plant their entire land area (usually about two hectares) with *Leucaena leucocephala*. Once this tree legume is established they clear one-third of their land and plant corn in between the trees' cut

and burned stumps. The other two thirds remain as a forest fallow which can be cut and carried to feed tethered cattle (Metzner 1983: 100, Jones 1983: 107).

b) Living fence of fodder trees

As in the planting of windbreaks and shelterbelts, trees in this system are planted along the boundaries of farm properties. Here they demarcate the extent of farmers' lands, pen or exclude animals and provide a source of fodder. In eastern Indonesia *Casuarina* and *Acacia* species have traditionally been used (Djogo 1990: 65). More recently however, *Sesbania grandiflora* and *Gliricidia sepium* have been popular.

c) Trees and shrubs on pastures

Suggested for extensive grazing areas, this system involves the irregular scattering or systematic arrangement of multipurpose trees on pasture land (Nair 1990: 58). The trees usually have some fodder value and can be used to diversify livestock diets. They also stabilise soil and provide shade for animals.

1.2.3 Agrosilvopastoral systems

a) Multi-purpose woody hedgerows

Any of the systems mentioned above can be adapted to an agrosilvopastoral technique by modifying the tree products grown so that they supply both agriculture and livestock. This system involves planting fast growing and coppicing fodder shrubs and trees in widely spaced hedges on farmland (Nair 1989: 59). The trees assist agriculture by providing mulch and helping soil conservation. They also supply crops for consumption by both livestock and humans.

b) Homegardens

These involve the planting of a large number and variety of trees around permanent housing, in a dense stratified arrangement. Depending upon their particular location, homegardens in Java have been noted to possess from 50 to 200 species of perennial (Penny and Ginting 1980). These include trees providing fruit, medicines, spices, fuelwood, fodder and construction materials. Contained also in these gardens can be livestock, vegetables and some food crops. Trees and crops are separated neither zonally nor temporally but mixed, with crops in the lower strata frequently being shade resistant. The fertility of trees and crops is assisted by addition to the soil of household garbage, ash and manure (Peck 1984: 206). Such is the productivity of this agroforestry system, Penny and Ginting (1980: 493) found that the homegardens of Miri-Sriharjo, in South Central Java, contributed more to household income than wet rice agriculture. This was even though the land occupied by homegardens was only half of the area used for wet rice.

The above constitute some of the primary structures of agroforestry systems. Numerous other permutations exist and can be developed by modifying these arrangements. As mentioned however, there is another way that tree-planting systems can be described, that is, by focussing on the socio-economic scale and management level of the activity. Emphasis in this situation is not on the particular physical technology but on characteristics like the area of land engaged by the technique, who has tenure to the land, who works the system and which individuals and/or groups receive the system's outputs. These management issues are just as important as, if not more significant than, the particular agroforestry technology used. They are crucial in determining the short term adoption and long term success of the system as a whole.

1.2.4 Tree-planting management strategies

Tree planting management strategies frequently come under the guise of social forestry. Like the term 'agroforestry', 'social forestry' is a generic term with many subtypes. The FAO (1989: 4) characterises social forestry as tree-planting to provide forest products for rural people who would not otherwise have access to them and the utilisation of existing forest resources so that people living nearby receive increased benefit. According to the FAO, social forestry is characterised by local people planning and executing their own projects, either as individual households or at the community level. It is generally held therefore, that social forestry has two major components: the satisfying of local people's needs for forest products, fuelwood and fodder and some degree of people's participation in the achievement of this goal (Davidson 1987: 1, Agarwal 1986: 106, Pereira 1989: 115). Particular social forestry subtypes are outlined below.

a) Community forestry

This management strategy involves establishing some form of agroforestry or woodlot on either unutilised or ill-utilised public or communal lands. It is preferable if wastelands are used which are not viable for agriculture (Basu 1984: 196). Local organisations usually select the land to be planted and control the activity, while local people manage the trees. External involvement may include supply of materials or professional foresters acting as extension agents (Davidson 1987: 1). Ideally, products generated are distributed along egalitarian lines throughout the community. These products may be of either a commercial nature, to bring income into the village, or may be used to solidify subsistence.

b) Farm forestry

This involves individual farmers growing trees on their privately owned land for their own benefit. Trees are planted, managed and their products consumed by the farmer's family

only, with possibly some assistance from neighbours. The number of trees grown is usually low and secondary to the major activity of growing agricultural crops. Thus, agroforestry techniques incorporating trees into boundary areas or home gardens are popular with farm forestry. Resource-poor farmers can use farm forestry to obtain small but valuable incomes from a minimal investment and to produce crops and materials to strengthen their subsistence livelihoods (Chambers and Leach 1989).

Farm forestry, sometimes called family forestry, is distinct from 'tree farming'. Unlike farm forestry, tree farming involves tree cropping as the primary activity and food crop production as secondary (Davidson 1987: 1). Trees are still grown on private land and managed and benefited from by individual farmers but the intensity and area of tree cropping is much more significant. In fact all of a farmer's land may be devoted to tree cropping alone. Additionally, trees are grown for commercial purposes only, rather than to supplement subsistence. Tree farming is normally only practised by wealthier farmers who can afford to devote large areas of land to a crop that takes many years to mature. It is also popular with absentee landlords who use it to produce crops for urban markets with minimal labour costs (Nair 1989: 594).

c) Local people's management of natural forests

Called also 'communal forest management', this activity involves local rural people cooperatively managing existing natural forests in their area (Mol and Wiersum 1990: 2). This management is usually based upon traditional strategies that were already in existence to control local forest users. Complexity of these strategies varies from those allowing all people free access to the forest as a source of fruits, medicines, timber, fuelwood and rattan, with a few controls, to more complicated strategies that give individuals rights over particular products. These strategies are embodied by a set of traditional or modified rules of forest usage to which local people have agreed (sometimes with external assistance in terms of mediation and rule construction). Mol and Wiersum (1990: 11-12) suggest that such strategies better

utilize nearby human resources in forest maintenance. They also improve the socio-economic condition of the surrounding population by providing them with continued access to these resources. To further enhance these strategies and thus, further assist people depending upon them, agroforestry practices can be incorporated into the natural forest thereby intensifying available output (Von Maydell 1991). Nair (1991: 15) suggests that the majority of agroforestry techniques can be adopted to forest lands.

To date, it has been commonly suggested that forest management strategies of this type cannot be applied to areas outside of their traditional realm without significant modification. Mol and Wiersum (1990: 23) have said that entirely traditional management strategies are difficult to replicate in other locations because of their site-specific nature and the relatively homogeneous population from which they originate. There has also been a lack of empirical data on these systems. This has made it difficult to determine the likely outcome of their promotion and has complicated the process of adapting them to new sites. Finally, Mol and Wiersum suggest that these techniques can really only be used for existing forest maintenance and not forest regeneration because many traditional strategies do not involve tree propagation.

Most recently however, as greater knowledge of traditional forest management strategies has been acquired, they have been seen to have increasing applicability. For example, systems that maintain and regenerate forest areas have been identified. Padoch and Peters (1992) indicate that the Tara'n Dayak of West Kalimantan have occupied their present land for several hundred years and retained it in a forested condition. By continually planting trees around their houses, which are relocated every twenty years, they have established diverse forest gardens across their lands. These *tembawang* gardens are abandoned at the time of house relocation but preserved to become areas resembling natural forest. Similarly, Foresta and Michon (1994) indicate that the 'damar' (*Shorea indica*) forest gardens, in the Lampung district of Sumatra, were created by the grandparents of contemporary inhabitants at the end of the nineteenth century. They are now maintained by current residents who continue to plant new

species into the gardens to enrich the diversity of trees when needed. Therefore, traditional management strategies are becoming increasingly relevant, even though the replication of any system is still acknowledged to require much care and planning.

d) Local participation in government owned plantation forestry

In this strategy trees of commercial value are established in plantations by the Forestry service using local people as a labour force. Both the land on which the plantation is established and the trees remain the property of government. In return for planting and managing trees, local people may be paid a wage and/or given the right to plant food crops between the trees, in the plantation's establishment phase. These intercrops are the property of local people alone. This management strategy is used in the *taungya* agroforestry technique. This activity however, is less strictly social forestry in comparison to the other subtypes described. The forest products are aimed at commercial markets and profits are kept by State or quasi-State agencies. Similarly, local people's participation in controlling and planning the activity is absent.

1.3 Specific functions and advantages of tree-planting systems

Advantages of tree-planting systems for subsistence farmers in semi-arid and sub-humid upland environments have already been alluded to in the description of those systems. Tree-planting systems provide fuelwood, fodder, live fences, building materials, windbreaks, shade and a great diversity of edible foodstuffs. The following describes particular advantages which tree-planting systems have been observed to possess.

In Tlaxcala, Mexico, Farrell (1990) examined the influence of a range of tree species on agroecosystem conditions. He found that they produced a more favourable microclimate for crops by reducing wind flows, reducing the maximum air temperature and increasing the minimum air temperature. Leguminous trees, commonly used in agroforestry techniques, such

as *Acacia albida*, *Prosopis juliflora* and *Erythrina glauca* also improved soil conditions. They increased organic matter, improved cation exchange capacity, brought nutrient concentrations to the surface, produced favourable pH conditions, increased soil moisture and improved moisture retention and stabilized the soil (Farrell 1990: 182). The only drawback of the trees in Farrell's study was that they reduced the growth of understorey crops because of shading. This was avoided however, if the tree species selected shed its leaves in the understorey crop growing season or could tolerate being cut back at this time. Further advantages included a better utilisation of vertical space, more efficient use of applied fertilizers because of the greater depth of the root system and reduced chance of insect proliferation due to improved species diversity (Budowski, 1982: 95-96).

Tree-planting systems are also purported to have economic advantages over other forms of land use.[3] In semi-arid areas of India, such as Tamil Nadu state, Jumbulingam and Fernandes (1987: 365) noted that tree crops were advantageous because of the stable demand and high prices offered for wood (be it timber, fuelwood or pulp) in relation to the unstable demand for agricultural crops.[4] Compared to annual crops, tree crops also required less labour and other inputs to establish and maintain. Hoekstra's (1987: 154) economic analysis of agroforestry techniques found that they had a higher output value at the same resource cost and/or the same output value at a lower resource cost, in comparison to non-agroforestry techniques. Higher output value resulted from increased physical outputs achieved through positive biological interactions between woody and non-woody components. It was also due to increase in the unit price of outputs, resulting from a capacity to defer the harvesting of tree products until their value increased, the greater quality of physical inputs required and a

[3] Experience with agroforestry techniques in Indonesia however, suggests that although followers can supplement their incomes and subsistence, the income generated is not enough to support all of their needs. It has been especially apparent with *tumpangsari* in Java that farmers have to undertake additional activities to earn a sufficient income and they are not independently supported by the system (Kartasubrata 1990: 189-191, SEAMEO BIOTROP 1990: 13-15). Nevertheless, this experience should not detract from the economic efficacy of other agroforestry techniques. *Tumpangsari* is a distinct form of agroforestry because farmers usually have no right to harvest the timber from trees, the activity's most valuable product. Thus, systems vesting ownership of the trees in farmers would be much more profitable for them.

[4] The value of trees for these purposes has been reiterated by Chambers and Leach (1989) who argue that trees planted on subsistence farmers' lands act as a store of wealth which can be tapped at their discretion to cover contingencies. The authors assert that trees used in such a manner compare well with assets such as jewellery, stock, land and bank deposits in terms of rates of appreciation and security.

decrease in the unit price of inputs. This resulted from biological interactions and the provision of green manure and mulch from trees, minimising the need to purchase artificial fertilisers and other inputs. Jumbulingam and Fernandes and Hoekstra state that tree-planting systems are also less risky, both economically and biologically, than other land uses. Economically, the demand for many tree products tends to be stable; and biologically, trees are more drought resistant than agricultural crops. The diversity of products grown by agroforestry also means these systems are more resistant to pests and diseases than monocultural systems.

1.4 Constraints to the adoption of tree-planting systems

Tree-planting activities incorporating agroforestry technologies are universal. Nair (1989: 74-84, 1990: 2-3) observes that they occur in twenty-two individual tropical and sub-tropical countries and are particularly widespread in three regions: Southeast Asia, the Pacific Islands and the Middle East and Mediterranean. Despite their extensive geographical coverage however, most of these activities remain traditional systems carried out by smallholders, for the purpose of subsistence. They have developed in isolation without substantial input from external agents. Although agroforestry technologies have traditionally been popular amongst rural dwellers, until recently they have been largely ignored by local professionals. More modern tree-planting systems (including some of those outlined above) have a relatively short history. Nevertheless, intensity of promotion in this time has been great and a variety of factors have been recorded as constraining their successful adoption and implementation. These include ecological or biophysical, technical, institutional and organisational, economic and resource, policy and socio-cultural factors. These operate individually or in combination to inhibit the adoption and diffusion of tree-planting systems. The following sections use examples from Southeast Asia, Africa, Central and South America and the Indian subcontinent to illustrate these factors and assess their relative importance in constraining tree-planting. It is only through understanding these constraints that methods for successful implementation can be ascertained and then tested.

1.4.1 Biophysical and ecological constraints

Biophysical constraints include the problem of competition between trees and food crops. There may be competition for nutrients and/or moisture between the trees and crops. Competition for moisture is a particular problem in semi-arid and savannah environments (Nair 1990: 13). In some circumstances tree crops can actively suppress the germination or growth of food crops through the release of toxins. This has been particularly evident with some *Eucalyptus* species (Nair 1990: 13). Food crops can also be impeded by increased air moisture resulting from the trees which favours disease (particularly fungi) and by increased soil erosion. Erosion is common below those tree species (such as *Tectona grandis*) which form large raindrops in their crowns (Budowski 1982: 95).

However, biophysical constraints can be avoided by carefully attending to species selection before planting commences. Nutrient competition, for example, is avoided by planting deep rooted trees that have minimal lateral spread. Similarly, tree species that allelopathically suppress agricultural crops should not be planted. MacDicken and Vergara (1990b: 362) have noted however, that in situations where tree crops do inhibit the growth of agricultural crops, attempts are not made to rectify the situation by experimenting with different tree species. Rather, these cases are focussed on and made known throughout the district so that considerable opposition is built up against the entire notion of agroforestry. Therefore, although biophysical constraints can be relatively easily avoided, it is important that experimentation with species selection is done before the technology is passed to farmers. This minimises opportunities for opposition.

Other ecological constraints to tree-planting arise from the pre-existing site condition. Sukandi (1990: 102) suggests that scarcity of soil nutrients is a major constraint to *tumpangsari* in Indonesia. In areas of Malaysia also, poor soils, unfavourable climate and water shortages have been major barriers to farmers implementing agroforestry (Ahmad and Abood

1990: 86). Problems of this nature are best overcome by selecting technologies that are suited to the location, and not promoting tree-planting systems at all if their failure seems likely.

1.4.2 Technical constraints

To overcome ecological limitations inherent in the site chosen for planting, attention must be given to sound silvicultural techniques. However, technical constraints have also frequently led to the failure of tree-planting. Insufficient knowledge of agroforestry practices on the part of both farmers and government staff (including researchers and extension officers) is an often cited problem in attempts to implement tree-planting (UNDP/World Bank 1988: 24, Sani 1990: 38, Siregar *et al* 1990: 30).

There are many locations where technical knowledge has been deficient. Davidson (1987: 93) noted in Southern Lombok, that initial attempts at social forestry were hindered by inferior nursery management and poor understanding of what trees to plant and where to plant them. Inadequate understanding of suitable tree species for particular habitats and ignorance of the optimal planting time also presented problems for tree-planting in Thailand (FAO 1989: 9). For Mnzava (1983: 26) however, the main obstacles to tree-planting in Tanzania were a mixture of technical and organisational factors. Mnzava asserts that many tree-planting attempts failed due to inadequate tree and woodlot maintenance. Once trees were planted little follow-up was provided. This resulted not only from ignorance of proper maintenance procedure but also from poor organisation of support to farmers, such as extension services.

When technical factors are considered together with organisational factors, as is done by Mnzava, a new perspective of the importance of technical constraints is obtained. If pre-project experimentation and planning are adequate, together with project monitoring and extension, then technical problems should be minimised. Therefore, when technical factors do constrain a tree-planting programme this is most likely a result of inadequate preparation and

organisation. The latter is the actual cause of project failure. There no doubt have been, and will continue to be, situations where a technical problem arises which was totally unforeseeable, regardless of the standard of organisation. However, when the level of organisation is comprehensive, these situations should be rare. It should also be possible to quickly identify and deal with problems that do emerge. This view that technical constraints only emerge as a result of omissions relating to some other aspect of a programme is supported by Burley (1982: 12) who says that with regard to activities in the semi-arid lands of India and Kenya,

> "...field techniques have been developed to facilitate the survival and growth of trees under a range of adverse environmental conditions of temperature, water availability, and soil type. However, in many locations these techniques are not being employed, and this failure is attributed more to economic and social factors than to technical obstacles...".

1.4.3 Institutional and organisational constraints

Poor planning and implementation (organisation) by inadequate agencies and the inherent institutional structure of these bodies are amongst the most important constraints to tree-planting programmes.[5] As indicated, good organisation by capable agencies can overcome both biophysical and ecological limitations and any technical difficulties arising.

A primary constraint to tree-planting systems is the institutional nature of those government agencies so often responsible for implementation. Lundgren (1989: 601, 1991: 6) asserts that government agencies in most tropical developing nations take their basic institutional form from either European or North American examples. This often results from the colonial history of developing countries and is perhaps reinforced after independence by belief in modernisation theory. In Europe and North America agriculture and forestry evolved as

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[5] The differences and similarities between institutions and organisations involved in rural development have been outlined in Uphoff (1993: 614). In this discussion 'organisation' refers to planning and management or implementation while 'institution' refers to the general nature of particular bodies be they recognised as institutions or organisations.

separate, exclusive activities. Consequently, so too did the bodies controlling them. Developing nations have inherited this feature, they have independent agriculture departments and forestry departments with considerably different systems of land management. This institutional character has evolved even though in most tropical, developing nations the historically dominant land use is shifting cultivation combining agriculture and forest fallows. Lundgren suggests that the presence of mutually exclusive and uncoordinated agriculture and forestry departments has been a major obstacle to introducing innovations that fall across these disciplines, such as agroforestry. The relevant departments have failed to introduce agroforestry because they are unsure of their role in relation to the technique and have been unable to coordinate and support one another in the required manner.

According to Lundgren (1989: 603) these agencies have inherited another constraining institutional character from their Western role models, by over-emphasising the maximisation of output. He suggests that agriculture and forestry departments in tropical countries have adhered to the maxim of commercialization at all costs and the aim of production for sale. There has been no support for land use systems producing outputs that are secondary to the main crop even though these outputs may benefit it ecologically, thereby increasing its stability. Sacrificing commercial output for stability and risk minimization, a feature of many agroforestry techniques, is foreign to agencies based on market principles. Another consequence of a commercial emphasis is the concentration of relevant agencies upon farmers involved in large scale export production (Thijs De La Court 1990: 35). Subsistence farmers have been just as much neglected as the agroforestry techniques that they find attractive.

Kaimowitz (1993: 1142) has observed that the spread of tree-planting systems is also constrained by the institutional nature of research bodies and extension services. Although forestry departments have shown some interest in researching tree-planting activities, Kaimowitz asserts that the research institutes of both forestry and agriculture departments have, in general, been designed to assist commercial production. They have little experience with agroforestry techniques. Furthermore, they test technologies for widespread adaptation

and are insensitive to local conditions and requirements, thus increasing the irrelevance of their results. With regard to extension services, Kaimowitz (1993: 1142) is critical of their dominant methodology which involves one-way prescriptions to farmers, rather than permanent dialogue and collective problem solving.

Nevertheless, the governments of many tropical nations have attempted to use their state agencies to introduce quasi-commercial, quasi-subsistence tree-planting systems to their farming communities. However, one of the most frequently cited constraints to the success of such innovations has been their 'top-down' approach. They have neglected to give local people the opportunity to participate in planning, monitoring, controlling and assessing these tree-planting projects. This again derives from the colonial origins of state forestry departments responsible for establishing tree-planting systems. Classical forestry, the traditional activity of most forestry departments, stresses the importance of trees and their protection from possible sources of danger, including people.[6] Hence, people-centred forestry, which emerges in tree-planting systems incorporating agroforestry techniques and social forestry principles, is unfamiliar to state forest departments and difficult for them to accept. It requires that forest departments work together with local people to manage forests that are for the use of those people, sometimes jointly with the state.

Examples of this institutional limitation occur around the world. Chambers, Saxena and Shah (1989: 166-167) argue that a lack of consultation with recipient farmers by implementing agencies, and a complete monopolization of control by those bodies, were the main reasons for the poor performance of community plantations in India. As local people could only participate in a passive manner, they did not support the projects and hence, they failed. The implementing agency misdiagnosed which species were preferred by local people. It was assumed that people needed fuelwood. This assumption however, was made without actual consultation of locals. In reality people required trees to also provide food, fodder and incomes. Chambers *et al* (1989:

[6] A tendency for the state to criminialise the activities of forest dwellers in order to prevent its interests in the forests from being jeopardised by these activities has been recorded in southeast Asia, particularly in Indonesia, Thailand and the Philippines, by Poffenberger (1990b) and Peluso (1992).

167) assert that species selection was based on the convenience of agency staff and not on actual needs. The involvement of local people was limited to providing their communal village land and to engaging in wage employment. In terms of controlling the plantations farmers felt that they would extract little benefit. Funds for establishing the plantations and thus for directing the projects were controlled by the Forestry Department and not a village organisation. Additionally, there was a failure by the controlling agency to define and publicise who had rights to the trees and the procedures for marketing and allocating benefits (Chambers *et al* 1989: 167). As farmers were not assured that they would benefit from the trees they were interested in neither managing nor protecting them.

Muthayya and Loganathan (1992) attribute the lack of farmer participation in Indian Forestry Department social forestry projects and its 'top down' nature to ingrained institutional characteristics. These include the traditionally hierarchical nature of the department. This results in its staff implementing activities in a hierarchical manner; a tendency to concentrate on physical achievements and the fulfilment of quantitative targets rather than the quality of participation in the development process; and a paternalistic attitude which conditions farmers to become passive receivers (Muthayya and Loganathan 1992: 734,740,743).

These same institutional constraints have been identified in Tanzania. Mnzava (1983: 15) indicates that species selection has been a major constraint to tree-planting. Mnzava suggests that most villagers know what types of trees they want. Foresters however, do not take these wants and needs into account because of the 'top-down' nature of their agency. Instead, foresters use traditional criteria to select species, such as whether the trees are multipurpose, fast growing and coppicing, without actively consulting the intended recipients. This paternalistic attitude also occurs in the extension service responsible for transferring the tree-planting technology. According to Mnzava (1983: 39) in Tanzania this service has freely given information but has had no capacity for receiving input back from farmers. Thus, over time its information has become increasingly irrelevant.

The UNDP and World Bank (1988: 23-24) have summarised institutional and organisational obstacles to village afforestation in Tanzania. These include poor planning overall and the absence of a body capable of coordinating the experience gained in tree-planting by national and international agencies (supported by Hammer undated: 15). Additionally, tree-planting has been constrained by inadequate monitoring and a poorly organised extension system.[7] There has been minimal coordination between forestry extension and that of other government departments, leading to overlaps or gaps in extension. There has been negligible female extension capability to understand the needs of local women. The UNDP and World Bank also point to a need for greater and earlier involvement of villagers in planning.

In Indonesia these same factors have been obstructive. Due to institutional constraints attempts by the Agriculture and Forestry Departments to reforest eroded lands in Central Java by involving local people have failed (Daru and Tips 1987). Constraints have included overcentralized decision making, poor coordination between agencies and defective or absent farmer cooperation, an inevitable result of the first mentioned factor (Daru and Tips 1987: 163). Peluso (1992: 152) adds that most State Forest Corporation (SFC, *Perum Perhutani*) social forestry projects in Java have failed because of the controlling agency's inability to account for the long and short term needs of the poor. Even when the SFC has tried to account for peoples' needs, by increasing the length of intercropping in *tumpangsari* projects, it has retained a 'top-down' approach to solving any problems with farmers emerging from these activities. This has hindered people's acceptance of the projects despite the concessions made (Peluso, Poffenberger and Seymour 1990: 234).

This same difficulty has been identified in Thailand. The FAO (1989: 74) reports that the major problem with tree-planting projects in that country is that they were planned and

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[7] Indeed Peck (1990) suggests that extension efforts in most countries are inhibited by inadequate personnel, lack of continuity and insufficient adaptation to local conditions. His work with agroforestry in Amazonian Ecuador leads him to conclude that improved extension systems must include multidisciplinary teams, be built on farmer experience and expertise, recruit local resident personnel, be site-specific in the sense that an individual work plan is made for each farm, include constant self evaluation, include linkages with national and international research organisations for technical support and initiate any projects within national institutions which can maintain continuity.

imposed from the top on a population that had no opportunity to say whether they accepted or rejected the proposal. The FAO observed that while the tree-planting plans were made with the well being of local people in mind, these plans were not so perceived by those people.

Therefore, the institutional structure and organisational ineptness of implementing agencies can be major constraints to the introduction of tree-planting. The presence of independent agriculture and forestry departments has been a structural inhibitor of efforts to coordinate the implementation of tree-planting using agroforestry techniques. Similarly over-emphasis on commercial activities and crops, by state agencies responsible for implementation, has limited the adoption of techniques that emphasise a degree of stability over commercialization. In terms of approach, implementing agencies have monopolized decision making and control, and failed to adequately consult and communicate with local people. The 'top-down' approach of many agencies has excluded people's participation. Finally, organisational ineptness on the part of implementing agencies has been a problem. Poor initial planning, inadequate monitoring and poorly structured and designed extension services are frequently cited obstructions.

1.4.4 Economic and resource constraints

The examples above stress the importance of institutional and organisational factors. They are essential to overcoming other influences such as biophysical, ecological and technical obstacles. However, there are other factors that inhibit tree-planting systems despite the standard of organisational expertise or perhaps institutional reform. Economic and resource constraints for example, also determine the success of tree-planting.

Availability of labour is a frequently cited resource constraint obstructing tree-planting projects (Ahmad 1990: 21, Ahmad and Abood 1990: 86, Gregersen, Draper and Elz 1989: 97, Blair and Olpadwala 1988: 15, Davidson 1987: 75). It is not the case that labour is in a

permanent state of short supply. However, the timing of tree-planting activities in relation to farmers' labour patterns is of crucial importance. If people are given new labour opportunities in a traditionally slack season then they will undertake that labour. However, if the additional labour makes demands on farmers during their existing peak labour season then they will be very reluctant to engage in that activity (Nair 1990: 58). Hence, new labour demands must not be perceived to interfere with farmers' existing labour patterns.

Mnzava (1983: 23) has observed the importance of timing labour burdens in Tanzania. When a choice has to be made between managing trees and food crops Tanzanian farmers understandably give priority to their agricultural crops. MacDicken and Vergara (1990b: 361) also, indicate that the labour of all farming families is constrained during the planting season. At this time they do not want to plant and care for trees. The problem is often unavoidable because tree planting is usually best done at the onset of the first rains. This is also the time that farmers are busy planting food crops. Even when farmers appear to support tree-planting programmes, this does not mean that they are free of labour burdens from their agricultural crops. Peluso *et al* (1990: 230) reveal that farmers participating in *tumpangsari* projects in Java often had to pay people to work their own fields while they worked on the *tumpangsari*. This reduced the benefits that farmers received from *tumpangsari* and weakened their resolve to participate in that activity.

Land availability is another serious constraint to tree-planting. Farmers are often deterred from planting trees on communal land because they are not assured of receiving any benefit; poor farmers especially prefer to plant on their own land for this reason (Muthayya and Loganathan 1992: 741, Soetrisno 1987: 262). However, there is often a shortage of private land to plant (Siregar *et al* 1990: 30, Gregersen *et al* 1989: 97, Blair and Olpadwala 1988: 15, Burley 1982: 19). Land shortages may be actual or merely perceived. Often farmers actually do have such small plots that they do not want to plant trees, except perhaps those with very small crowns (MacDicken and Vergara 1990b: 361). There is considerable competition for land from agriculture and grazing (Wiersum 1984: 24, Arnold 1984: 51). Many farmers perceive

that using land for trees is at the expense of food production or grazing livestock. However, as is evidenced in the description of agroforestry techniques, tree legumes in particular can perhaps increase food production when interspersed with agricultural crops. Similarly, fodder trees can increase the amount of food available for livestock. Therefore, land shortage is frequently a perceived problem only, aggravated by local people's isolation from information about modern tree-planting systems.

A lack of capital and financial resources on the part of project organisers is another inhibitor of tree-planting programmes (Gregersen *et al* 1989: 97, Wiersum 1984: 21, Sani 1990: 40). Budgetary difficulties and a consequent lack of equipment reduced the survival of plantations in Thailand (FAO 1989: 9). Similarly in Nigeria, Osmeobo (1989: 124) states that a major constraint to tree-planting was a small budget that limited the number of seedlings given to farmers. Again in Tanzania, inadequate funds limited nursery operations; an essential component of all tree-planting activities (UNDP/World Bank 1988: 24, Werner undated: 17).

A resource constraint identified in Tanzania has been a lack of transport facilities and infrastructure (Hammer undated: 15). Without an existing transport infrastructure that can be utilised by programme implementers an extra burden is placed upon already stretched budgets. In Tanzania poor transportation adversely affected nursery activities, seedling deliveries and extension mobility (UNDP/World Bank 1988: 23). Inadequate transport infrastructure can also affect people's willingness to adopt tree-planting technologies by increasing the expense of taking tree products to market. Conversely the improvement of transportation to the Gunung Kidul area of Central Java made it possible for farmers to sell firewood and thus encouraged them to plant trees (Nibbering 1991: 119).

Market imperfection is another limitation. Problems with the market can take numerous forms. As indicated above the problem may be one of access. It may be expensive to get tree products to market or it may be difficult to get inputs needed to continue the tree-planting activity (Nair 1990: 58, Chambers *et al* 1989: 187). Alternatively, markets may not exist for

products or prices which farmers actually get may be over-estimated by project planners. In these circumstances farmers soon lose interest in tree-planting altogether. The FAO (1989: 9) stresses that market analysis must be an essential part of project development. The existence of a market and suitable price for tree products is given paramount importance by Godoy (1992: 714-717). He says, in relation to trees with commercial value, the existence of a good price can motivate independent adoption of particular trees and overcome the constraining effects of other factors, such as tenure problems and labour shortfalls. In a similar vein, Von Maydell (1988: 3) says that, "People will only accept and further develop agroforestry if it 'pays'." Regardless of an agroforestry system's biological and technical potential, it will not be adopted by rural people unless it makes some material improvement to their living conditions. Agroforestry systems will not succeed if they merely encourage farmers to undertake "stoneage practices" (Von Maydell 1988: 3).

1.4.5 Policy constraints

Government policy is another factor that may be beyond the control of agencies responsible for implementing tree-planting programmes. Government policy and its practical manifestation, legislation, can be changed with sufficient pressure and argument from implementing agencies. However, most often it is static, particularly in the short term. Consequently, tree-planting programmes must be aware of, and operate within, its confines. Unfortunately these confines are frequently rigid and obstruct tree-planting's success.

Problems with the incumbent land tenure system often present a very important policy constraint to tree-planting (Rahim 1988: 57, Daru and Tips 1987: 163, Arnold 1984: 57). Sani (1990: 38) for instance, argues that in the Sabah pilot agroforestry project, trees were planted on land owned by the Forestry Department, not farmers. Farmers were not inclined to continue participating in the project because they did not believe they could assert a right to the trees and hence derive benefit. In Honduras, peasants had been forced to clear forest areas due to

their marginalization by cash cropping. They could not however, be encouraged to remain on these newly cleared lands, nor improve them with tree-planting, because they could not get secure, official land tenure (Jones 1988: 159-160). Nevertheless, even when farmers have tenure, it must be assured in the long term before they will adopt long term agricultural strategies, such as tree-planting (Nair 1990: 58).[8]

Chambers *et al* (1989: 177) summarise the characteristics of land tenure systems that discourage farmers from planting trees on their own land. Insecure land tenure is a disincentive. Insecurity includes farmers not being guaranteed tenure in the long term and not possessing their land free from encumbrances imposed by other parties. Such encumbrances may include farmers having leasehold rights only or other family members having some right to their land. Therefore, farmers' titles must be entire and obvious. The boundaries of their land must be fully demarcated, they must be given formal deeds or certificates of title and government records of the title must be updated. Planting trees involves a considerable risk in terms of the amount of time invested before a return can accrue. Anything jeopardising farmers' rights to receive the benefits from tree-planting will strongly discourage them from commencing that activity. This notion is supported by Bruce and Fortmann (1988: 5) who state that, "...people will not preserve, protect or plant trees nor allow others to, if doing so is costly to them personally...".

Policies and rules affecting tree tenure also influence farmer willingness to engage in tree-planting (Blair and Olpadwala 1988: 37). Tree tenure relates to local people's rights to use trees and tree products and their rights to dispose of those products (Nair 1990: 58). It also involves the right to dispose of the tree itself (destroy the tree, lend it, lease it, mortgage it, give it or sell it), the right to plant trees and the right to own or inherit trees (Fortmann 1988: 17-18). Chambers *et al* (1989: 180) say that farmers should be given an unfettered right over the

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8 These are just some of the problems for tree-planting deriving from land tenure systems. Numerous other problems could be cited. Peasants, for example, may be prepared to plant trees but they may be prevented from doing so by elites who find the land tenure system unfavourable. James and Fimbo (1988) illustrate this in Tanzania. Under customary land law, tenure to land could be obtained by tenants from original owners if tenants planted trees on the land they occupied. While such a system may provide an incentive for tenants to plant trees it is more likely that it would result in landowners prohibiting tenants from tree-planting altogether.

use and exploitation of trees if they are to be encouraged to plant them on private land. Farmers will be less inclined to support a project when the trees planted on their land are jointly owned by a state agency or local authority. Similarly, the project will be constrained if tree ownership is ambiguous and not succinctly outlined (Chambers *et al* 1989: 196). It is also obstructive if farmers' rights to cut and fell trees are restricted or perceived to be restricted. Finally, limitations emerge where farmers' rights to transport tree products to market are limited by government policy, or believed to be so (Chambers *et al* 1989: 196).

In Haiti, planners of a tree-planting scheme adhered to the suggestions of Chambers *et al* with extraordinary results. Murray (1988: 219-222) describes how small farmers who agreed to plant trees on their land were repeatedly assured by organisers that they alone would own the trees and that the project would forfeit all right to them once planted. They also guaranteed farmers that the trees could be cut whenever desired and that they could be uprooted if the farmer so wished. In the middle of its third year this project had resulted in more than 6 million trees being planted by some 10,000 different households with good survival rates. Farmers were protecting their trees with most losses attributable to climate.

However, constraining state policies do not only relate to land and tree tenure. Obstructive legislation can affect any aspect of a tree-planting programme. Blair and Olpadwala (1988: 37) note that legislation affecting the price of tree products can singlehandedly render tree-planting unviable. Alternatively, establishment of an attractive price structure can lead to adoption by farmers without external stimulus (Godoy 1992: 714). In Tanzania Mnzava (1983: 33) records that legislation governing forest royalties encouraged local villagers to log wood from remnant forest in order to augment their village funds. As this legislation did not require that a portion of money obtained from logging be reinvested for reforestation and afforestation, local people logged existing forest but did not engage in tree-planting.

1.4.6 Socio-cultural constraints

Socio-cultural factors have often been overlooked by tree-planting project implementers because they have been considered unimportant or easily modified. It has now been recognised that these factors are of the utmost importance in those projects trying to engage the cooperation and participation of local people. The particular social context in which recipients operate must be understood for them to adopt tree-planting innovations and project organisation must be modified accordingly (Nair 1990: 61).

Village structure has been a highly obstructive socio-cultural factor. The failure of community plantations or woodlots has often resulted from weak leadership at the village level (Pereira 1989: 116). Mnzava (1983: 30) for example, states that in Tanzanian villages, leaders are often elected according to social background rather than ability. Consequently, respect for them is not great. This reduces their effectiveness in motivating people to plant trees. It also means they have little power to enforce the protection of communal woodlots.

However, Mnzava recognised that inadequate leadership was not the only constraint arising from village structure. A further problem was the unwillingness of villagers to cooperate together because of their differing interests with regard to trees (Mnzava 1983: 30). Pereira (1989: 116) has also observed that a lack of social cohesion in the village is very obstructive to the success of community woodlots. If villagers do not agree to make and honour agreements about the protection of woodlots from livestock and theft for example, then they will not succeed.[9] Davidson (1987: 93) also observed in Southern Lombok that social forestry there was constrained by a lack of farmer commitment to work together.[10]

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[9] West (1983) explains that almost all tree-planting activities require some community cooperation, if not to plant the trees then to protect them. Consequently, he says that their adoption must be collective adoption with all of the burdens that this encompasses, including the prerequisites of good leadership and a willingness of farmers to work together.

[10] Others to have noted this phenomenon include Thomson (1988) who with regard to Sahelian forestry states that local initiative cannot sustain collective action if social cohesion is lacking and Noronha (1980) who described village factionalism as the most important obstacle to successful tree-planting programmes.

According to Cernea (1987: 175, 1989: 39) the heterogeneity of village communities is the main reason why community forestry demanding whole village cooperation will never be successful. He argues that an entire community cannot be used as the unit of social organisation to establish and manage tree-planting. This is because communities are generally large, non-homogenous and unable to sustain long term projects.[11] Supporting the observations of Mnzava, he says that the interests of community members often differ, so that unified action is impossible (Cernea 1987: 175). He continues by saying that the use of communal lands is not desirable because its tenure status is often uncertain.[12] Furthermore, the distributional arrangements within a community are frequently distorted in favour of local elites and these are transferred to tree-planting projects if the community is used as the operative unit (the constraining nature of inequalities in village structure is supported by Agarwal 1986: 126). Finally, Cernea (1987: 175) argues that communities are not necessarily organised as joint producers in any other respect. Hence, it is very difficult to organise them in such a manner with regard to tree-planting. According to Cernea (1989) cooperation is more likely to be guaranteed if smaller units of social organisation are used, such as family groups, and if private land is utilised rather than communal land.

An underrated socio-cultural constraint of tree-planting programmes is that of farmer perceptions and beliefs. Farmers may perceive obstacles to and problems with tree-planting, that may be totally erroneous and not based on fact, but which nevertheless erode their willingness to support a project. Constraining perceptions and beliefs may come in many forms. For example, farmers may not perceive a need to plant trees. This has been observed in Thailand and Indonesia where local people have not wanted to involve themselves in government replanting for fuelwood because they do not perceive a need to plant trees for this purpose. These perceptions were based on the fact that there was no critical shortage of

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11 The concept of communities being non-homogenous is supported by Wignaraja (1989: 34).

12 Cernea's (1988) study of Shamlat land in Pakistan illustrates well the uncertainties and dangers of using communal land to plant trees intended to benefit all community members. Although the Shamlat land was traditionally and technically communal land it had been partitioned over time by families whose own lands abutted it. These families did not reveal their ownership of these lands to project planners (who were unaware of the situation) because they hoped to get their lands forested at government expense.

fuelwood for the present, even though there would be in the long term without this reforestation (FAO 1989: 9, Nibbering 1991: 114). In Kenya and India, Burley (1982: 17-18) observed this same belief amongst farmers. They were not prepared to plant trees and work to get wood because it had been their experience that there was always an abundant supply of wood with no cost except that of gathering it. Another constraining belief of farmers in Thailand was a feeling that they would not benefit from the trees and thus it was not in their interest to plant them. This perception was based on their past experience that it had always been illegal to fell trees in reserved forests and that it would therefore also be so in these government funded forests (FAO 1989: 9).

Amacher *et al* (1993) also stress the importance of farmers' perceptions of the people encouraging them to plant trees, in their situation professional foresters, and the importance of the perceptions of those foresters. Amacher *et al* observed that farmers gave importance to foresters' moral behaviour, honesty, equality of treatment and familiarity with local conditions whereas foresters thought it far more important to have technical knowledge (1993: 451). Therefore, project implementers need to accurately assess not only farmers' perceived needs but also what farmers' perceive to be an appropriate attitude for them.

Finally, Sani (1990: 40) has observed in Sabah that traditional beliefs can obstruct tree-planting's progress. He reports that farmers have a traditional belief that they are not allowed to work if they encounter certain birds or animals in their fields. This belief, common amongst animist groups, considerably disturbed the working hours that farmers devoted to tree-planting.

The nature of these obstructive perceptions indicates that the real constraints are the underlying factors generating these beliefs. To overcome the limitations of people's perceptions, project implementers must understand why people have these feelings so that they can be allowed for by project planning. The needs of local people must be revealed and their traditional culture understood. Observation of participants' historical experiences must also be made. Tucker (1984: 341) emphasises that historical experience is the unseen consideration in the

success of social forestry programmes. Historical struggles between landed and landless villagers, between rural and urban people, and between villagers, forest contractors and professional foresters all determine how people react to tree-planting in the present. Most social forestry projects do not consider the historical factors underlying farmers' obstructive attitudes but villagers in reality have long memories of competition and conflict (Tucker 1984: 341).

Another socio-cultural limitation to the adoption of tree-planting activities is the particular groups that agencies are encouraging to receive these techniques. It is believed that tree-planting systems are suited to improving the livelihoods of subsistence and near-subsistence farmers in tropical, developing nations and that they have often been planned for this purpose. Focussing on these groups however, immediately makes the task of promotion more difficult. Poor farmers are not risk takers because of their minimal resource base and therefore, they are less inclined to adopt new technologies (Nguyen Ngoc Luu 1988: 333, Hardjono 1991b: 10).

Nevertheless, as stated by Thomson (1988: 205), while small farmers follow a policy of risk minimization this does not mean that they will not take risks. What is required are innovations that guarantee economic profit. It has often been noted that subsistence farmers will participate in activities (including tree-planting[13]) that can be shown to be financially feasible and economically rational (Kunstadter 1978: 292, Pelzer 1978: 286). It is possible to encourage small farmers to innovate but the task is immediately a more difficult one with the burden of proof being on project implementers to show that their activity is profitable and safe.

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13 A good example of this comes from Haiti and is described by Conway (1988) and Murray (1988) where excellent farmer participation has been assisted, not only by secure tree tenure, but by showing farmers that tree-planting can be economically profitable in the present thereby appealing to farmers' desire for guaranteed income improvement. Holden and Joseph (1991: 181) also found in a project promoting agroforestry in Zambia that resource poor farmers could be encouraged to experiment with new technologies. This was done by keeping experiments with innovations small and only engaging those resources in abundance, thereby reducing the risk to farmers.

Subsistence farmers tend to be more cautious and may wait until they have seen others successfully engage the innovation before they commit themselves.[14]

Finally, farmer inexperience and lack of understanding of the processes and benefits of tree-planting can present difficulties. In Nigeria, for example, farmers were ignorant of the benefits of agroforestry techniques and hence, not inclined to support them. As they had never harvested nor sold trees in such a system, its economic incentives had not been demonstrated to them (Osmeobo 1989: 124). Similarly in Tanzania, Hammer (undated: 15) states that a constraint to farmer participation in tree-planting was a lack of villager awareness of the role of forestry. Therefore, project planning must gauge the pre-existing level of farmer understanding and appreciation of tree-planting so that extension efforts can be arranged accordingly.

1.5 Conclusion

Shifting cultivation continues to support most people in the semi-arid to sub-humid uplands of many developing nations. However, this livelihood system is believed in many instances to lead to environmental degradation. As this process occurs, it is thought that the system is no longer capable of sustaining farmer subsistence. Without intervention, it is argued that the future can only be a downward spiral of increasing poverty and further environmental destruction. It is widely held by government and non-government agencies, that one of the most suitable solutions to this problem, especially in the short and medium terms, is the incorporation of tree-planting activities into the existing cultivation system. Those tree-planting systems believed most suitable combine agroforestry technologies and social forestry management strategies. Attraction to tree-planting systems comes from their consistency with the currently accepted concepts of sustainable development and appropriate technology and from the real advantages they are purported to have in the field. Agroforestry enhances the

[14] Vorauri (1982: 106) noted this in the highlands of Thailand where those of higher socio-economic status accepted a new agroforestry system relatively quickly while those barely making subsistence continued to use the traditional system until they could see the project's results.

productivity of existing agricultural activities thereby increasing farmers' real incomes while at the same time stabilising the environment. Social forestry ensures the resources from any such intervention are distributed equitably and assists in achieving adoption.

However, despite the alleged economic and environmental advantages of tree-planting activities a variety of constraints to their adoption have arisen. Summarising the relative importance of these constraints, it is evident from the discussion above that biophysical and ecological factors should not have the ability to jeopardise tree-planting programmes. In extreme biophysical conditions, such as very arid environments, tree-planting may be rendered impossible. In most environments however, it should be possible with adequate pre-project assessment of conditions and selection of appropriate planting and management techniques. Similarly technical difficulties may hinder but they should not lead to the collapse of tree-planting programmes. The crucial factor in overcoming biophysical and technical problems is the standard of organisation exhibited by project implementers and their institutional structure. If pre-project planning and assessment, and ongoing monitoring are substandard then it is likely that biophysical and technical difficulties will emerge. Therefore, the quality of organisation by implementing agencies and their inherent structure can either overcome problems and facilitate tree-planting or they can be the dominant constraint.

Less obvious from the examples cited, is the ability of implementing agencies to overcome policy, economic and resource, and socio-cultural constraints. In the short term it is very difficult to overcome entirely existing policy problems. The process of lobbying for policy and legislative change tends to be drawn out. Implementing agencies can however, try and identify likely policy barriers and then select technologies least likely to be disrupted, that is, they can work within the policy obstacles. The actual ability of implementing agencies to avoid obstructive policies however, is unclear and probably depends on the strength of the obstacle. Economic and resource problems, if existent, are also beyond the immediate control of organisers. Availability of land and labour are particularly limiting. Again it is possible that organising agencies can minimize the obstacles presented by these factors. The most obvious

way to do this is again through the selection of appropriate tree-planting technologies, such as those using available land and those timing labour burdens consistently with farmers' existing patterns. It is likely however, that in particular circumstances there will be economic and resource factors that are very difficult to overcome. Finally, the inhibiting effect of socio-cultural factors is equally hard to reduce. Limitations deriving from village structure are inevitable and impossible to eliminate. The task of organisers is again to operate within the confines presented by village structure. The ability of organising agencies to overcome problems arising from local people's perceptions is even less clear. To identify what people's reactions to tree-planting may be project organisers must examine the traditional culture and past experiences of these people. Implementing agencies must also allow farmers to express their needs and thoughts and then take these into consideration. Whether organisers can design programmes sufficiently sympathetic to people's perceptions and whether they can motivate populations with clearly obstructive feelings (or perhaps change these perceptions) is uncertain and probably dependent on individual circumstances. Nevertheless, agencies with a 'bottom-up' approach may be more suited to overcoming difficulties arising from local people's preconceptions.

Therefore, the most important factor determining the success or failure of tree-planting programmes is the quality of organisation by implementing agencies and their institutional structures. Management is the variable over which implementers have immediate control. Inadequate organisation is an obstacle in itself and it allows other problems to emerge and hinder project progress. It remains uncertain however, whether it is really possible to manipulate the nature of organisation and management given the ingrained institutional structure of many agencies responsible for tree-planting. Moreover, economic and resource, policy and socio-cultural constraints, if they are sufficiently powerful, can lead to the failure of tree planting on their own. The ability of implementing agencies to overcome these factors in different circumstances is unknown, as is the exact form of organisation required to achieve this task.

CHAPTER 2

ENHANCING THE ADOPTION OF TREE-PLANTING ACTIVITIES

2.1 Changing to a participatory approach to enhance adoption

2.1.1 Changing the institutional nature of agencies responsible for tree-planting

The best method for overcoming constraints to tree-planting is by altering the organisational and institutional natures of agencies responsible for their implementation. This view is based on the premise that some of the most serious obstacles emerge from these factors. Similarly, better organisation and institutional structure overcomes other limitations, and these alterations are within the immediate control of implementing agencies. Unclear at present is the type of institutional and organisational reform required, and how that reform can be brought about, so that tree-planting innovations are diffused successfully, while still leading to economic and environmental advantages in a manner consistent with sustainable development principles.

2.1.2 The 'bottom-up' approach

Any institutional or organisational change should not merely aim to get tree-planting systems adopted. Tree-planting must be adopted in a way that leads to development in the region. This essentially means that adoption amongst the poorest groups must be achieved. Chapter 1 concluded that the major obstacle to tree-planting activities was the institutional nature and organisational approach of agencies responsible for implementation. This discussion

therefore, focusses on appropriate organisational approaches to tree-planting and the best institutional forms to control these.

It was suggested that a significant institutional constraint to tree-planting was the 'top-down' nature of implementing agencies. A logical preferred approach therefore, is from the 'bottom-up'. A 'bottom-up' approach is based on the principle that local people better understand their own situation and requirements than any other party (Watson and Holloway 1989: 26). Village people are aware of their potentials and needs and are thus a valuable source of information from which to launch activities aimed at development. Furthermore, their traditional knowledge has often evolved from generations of experience in the region and should thus be built upon rather than disregarded in preference to external strategies (Persoon and Wiersum 1991: 95, Pierce Colfer 1988: 175, Vayda *et al* 1985: 22, McNeely and Pitt 1985b: 4). Edwards (1989: 120) contributes to this view by saying that relations between people and their environment are dynamic, seasonal and often unpredictable. Consequently, they cannot be subjected to general models. True understanding of the local situation is hence best obtained from those people with the greatest experience in it and who are responsible for its form.

Unfortunately, unless a special effort is made, the poor are normally unable to communicate their thoughts, even with regard to programmes designed to assist them. Watson and Holloway (1989: 36) indicate that they generally live away from government services, such as communication infrastructure and transportation. This makes it difficult for them to express their viewpoints and means opportunities often pass them by. Additionally, because of their low social status they frequently have little capacity to effect change in their own area and are often too embarrassed or frightened to do so anyway. Unless special efforts are made to seek them out, they are unseen and unheard (Watson and Holloway 1989: 36). Too often however, these efforts are not made. Decisions about the poors' welfare are made by planners who do not consult them because they consider their opinions of little value and by decision makers who are sheltered from the realities of people's problems because of an approach which encourages intimidation, shame and consequent non-communication.

Trainer (1989), in outlining a preferred approach to development, makes two specific references to the desirability of starting from the local level. He also gives some indication of what a 'bottom-up' approach entails. The fourth of his eleven 'principles of appropriate third world development' emphasises making existing resources, particularly capital and land, available to locals so that they can identify their own priorities, plan their own strategies and employ those resources that they consider necessary to meet their needs (Trainer 1989: 200). Therefore, local people are given a measure of control over the tools necessary for development. Trainer's sixth principle gives some idea of the extent of this control. It adheres to the concept of small being beautiful and stresses decentralisation, democratisation and giving greater autonomy to local regions (Trainer 1989: 200). The use of local inputs should be maximised and dependence on foreign capital and expertise reduced (Trainer 1989: 200). Reducing the influence of external agents, especially at the local level, and having people of equal status work together to formulate development activities (so that they are not intimidated by those of apparently greater power) helps to achieve this decentralisation and democratisation (Butcher 1988: 203).

A 'bottom-up' approach therefore, requires the people who are supposed to benefit from the development activity (in this case the adoption of tree-planting systems) to be involved in the process of implementation.[1] In other words their 'participation' in the process must be assured. This benefits the project by accessing local knowledge and experience and by enhancing people's interest and understanding. The Nusa Tenggara Timur Integrated Area Development project in Eastern Indonesia found the best way to get local farmers to use and maintain technologies introduced into their villages was by involving communities in planning and decision-making so that they felt some sense of ownership over the technology (Mylius 1987: 3). The process of participation not only makes villagers more inclined to adopt innovations in the short and long terms (Craven 1991: 3, Brookfield 1993: 371), it also

[1] There is no doubt that local people can be efficient managers or joint managers of technologies introduced, resources mobilised or plans made. Their ability to achieve these tasks and develop sustainable alternative livelihood activities was accentuated at the International People's Forum, made up of individuals from the environmental and developmental NGOs of numerous countries (Andrews, 1992).

increases their independence, confidence and self-reliance so that they can help themselves in the future (Rahman 1981, Wignaraja 1984, Lea 1992: 18). By using this approach, local people benefit not only from the innovation but from the process by which it is introduced.

Edwards (1989) is a strong advocate of the participatory approach to development. He asserts (1989: 120) that development is a process of enrichment, empowerment and participation. Development is not only achieved by introducing a new technology into a community but by the manner in which this introduction occurs. These thoughts are echoed by Clark (1991: 22) who believes that to achieve development it is necessary to build up in people confidence, skills, assets and a feeling of freedom. He regards participation in the process of development as essential to the establishment of these criteria.[2] Francis (1993: 206-207) also supports this view by saying that rural development is essentially human development. The development of physical 'things' should be secondary to the improvement of the physical, spiritual, social and political condition of humans via the elimination of phenomena like discrimination and social inequalities. Francis says that to achieve this human development a particular process is needed and that is participation.

2.1.3 Articulation of the meaning of participation

It was stated above that the adoption of tree-planting systems and the chance of successful development may be increased by using a 'bottom-up' approach that encourages the participation of intended recipients of the development activity. Contained in the stated

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[2] Zainuddin and Sweeting (1989) and Terrent and Poerbo (1989) provide examples of the advantages of starting development activities from the bottom and creating self-reliance and confidence. In Klaten, Central Java, programme success and sustainablity was enhanced by the principle that the rural poor should be involved as much as possible in planning, implementation, monitoring and evaluation. The poor were to do it themselves with the help of just a few facilitators (Zainuddin and Sweeting 1989: 180). The skills learnt through this involvement made equal if not greater contributions to development than technologies introduced. In Ciamis, West Java, the most undeveloped community was assisted to build up its own capacity to confront progressively more complex problems (Terrent and Poerbo 1989: 174). This made two contributions to overall development. It improved the self-reliance of this community and it meant that surrounding communities were also inspired to improve their own condition. They believed that if the poorest village could do something for itself then they could as well.

advantages of this approach was some indication of what participation involves. Local communities should be involved in decision-making and planning. This implies that local people be given management rights and control over programmes. This is consistent with the views of Edwards, Clark and other theorists who see participation as a process of empowerment (Jazairy 1988, Ghai 1990). Seeing participation in this manner is very different from other popular definitions.

Ghai (1990: 82) identifies two other types of participation commonly used in development programmes. The first interprets participation as a process of mobilising local people to act as a labour force for projects conceived, designed and controlled from higher, external agencies. It is doubtful however, if this interpretation of participation has any long term benefit for locals. It does not encourage self-reliance as it gives them no experience in planning and controlling projects. It may even inhibit people's acceptance of ideas or innovations being promoted by the programme, because they feel they have no sense of ownership or control. Another version of participation suggests that it can be achieved by decentralising government resources and decision-making powers to lower level agencies, including local officials, elected village bodies and specially created project committees (Ghai 1990: 82). Again however, the hypothesised benefits of participation will not accrue unless there is actual involvement of those people the project is particularly aiming to help. If the development activity is hoping to assist the deprived and excluded it must empower and involve them in the process of change. Therefore, there are different scales of participation and those versions that do not sufficiently empower recipients are less effective.

The notion that there are different scales of participation has been most fully described by Cohen and Uphoff (1980). They developed a basic framework for determining the degree of participation in development programmes. They first developed what they termed the dimensions of participation (Cohen and Uphoff 1980: 218-225). The first dimension was the kind of participation. Participation could be in decision-making, programme implementation, benefits or disadvantages and programme evaluation. Additionally, within all of these varieties

of participation people could be involved to a varying degree. For example, they may only be invited to make decisions in the early phases of the programme, or they may be able to contribute in an ongoing manner. Cohen's and Uphoff's next dimension looks at who is participating. Is it local residents, local leaders, government staff or foreigners? Similarly, within these general divisions they suggest questioning whether it is the young or old residents, the males or females, educated or uneducated and so on.[3] Finally, they assert that it is necessary to observe how participation is occurring. This includes consideration of whether the programme was inspired from above or below, whether inducements to participate are voluntary or coercive, whether the project is arranged in a manner that can be understood by recipients and other structural aspects (Cohen and Uphoff 1980: 224).

The second part of the Cohen and Uphoff framework examines the context in which participation is encouraged, to determine whether participation is likely or not in the particular situation, despite the intentions of programme initiators. The contexts of participation first involve observing the characteristics of the project being promoted (Cohen and Uphoff 1980: 225-226). They list ten characteristics affecting the ability of projects to incorporate participation. These include the nature of the technology being introduced, with overly complex innovations perhaps excluding the involvement of the less educated; resources required to implement the innovations and who has access to them; integration of the project with complementary programmes such as credit provision and the programme's ability to respond to contingencies. Other characteristics focus on the nature of benefits, particularly their tangibility, probability, immediacy and divisibility. Finally, they consider the nature of programme administration, suggesting that projects facilitating communication between project recipients and organisers (especially leaders) improve participation. The other context in which Cohen and Uphoff suggest considering the extent of participation is the task environment. They argue that despite all of the efforts of project organisers there will be circumstances in the inherent

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[3] The importance of involving women in the planning and management of agroforestry and social forestry is discussed by Rocheleau (1988) who provides reasons for the involvement of women and suggests types of activities more useful to them.

environment that will constrain participation, these include physical, political, economic, social, cultural and historical factors (Cohen and Uphoff 1980: 226).

The framework of Cohen and Uphoff, while not actually defining at what stage true participation is achieved and what is a desirable level of participation, gives a guide as to the sorts of factors that should be considered when aiming at its achievement. It is also implied in the recognition of the task environment as a constraint that there will be circumstances in which participation cannot occur, at least not perfectly. To complement the analysis of Cohen and Uphoff it is useful to observe Ghai's (1990) practical methodology for enhancing participation in development projects.

Ghai (1990) studied the outcomes of nine projects attempting participatory development. These projects were located in Nepal, India, the Philippines, Sri Lanka, Zimbabwe and Rwanda. From these examples Ghai (1990: 92) concluded that participation could be promoted by including a preparatory phase involving interaction between project organisers and local people. This process of discussion, analysis and reflection increased people's understanding and willingness to engage in the activity. The second method by which participation was consistently promoted was by an institutional structure that encouraged recipients' priorities and thoughts to be aired and asserted. This structure usually involved the division of people into small groups to provide a forum for dialogue and discussion. These groups reduced feelings of insecurity amongst recipients and generated confidence by developing collective strength amongst the normally powerless poor (Ghai 1990: 95). The groups then became the basic unit of organisation for the projects. They could be used as working units or as joint receivers of project activities or benefits. Finally, Ghai (1990: 98) notes that in most projects, after self-reliance had been established, external experts were phased out and members of the local population selected to take over their functions, thereby completing the process of participation.

2.1.4 Problems with the 'bottom-up' and participatory approach

Due to the participatory approach's emphasis on promoting innovations amongst the poorest groups, contradictions emerge when government agencies, the major implementers of innovation adoption projects, attempt to employ this method. Many development projects now emphasise the participation of local people. Few however, grant real empowerment to project recipients. Rigg (1991) identified a lack of genuine participation in development programmmes in Thailand, despite stated intentions to the contrary. Nevertheless, Rigg does not conclude that efforts should be made to incorporate a better type of participation. He asserts that participation is not obtainable in all circumstances and when this is the case it should not be attempted.

Rigg (1991: 200) reveals that Thailand's Fifth five year National Development Plan had six main characteristics, two of which referred to decentralization of planning and the promotion of local initiative. The Sixth plan then went further by encouraging ordinary people to find "...solutions to their own problems on the basis of self-reliance" (quoted by Rigg 1991: 200). This was to be done by strengthening local organisations and mobilizing local resources. There were also hopes under this plan to disperse authority to the local level to encourage participation. In reality however, these plans never eventuated and Rigg attributes this to the nature of Thai bureaucracy and society. They were constrained by various interest groups and government ministries that were imperative to their implementation (Rigg 1991: 201). Rigg suggests that it is contradictory for central governments to try and implement grassroots development. He argues that self-reliance and participation cannot be decreed from above because government involvement of any type will result in some form of control. He demands that action arise from the local level. Rigg (1991: 203) feels that popular participation in Thailand is really just a form of mass mobilization. There are no genuine attempts to assess the aspirations and motivations of planned recipients.[4] Due to the inherently unequal nature of Thai society however, Rigg is not confident that local people would be able to initiate projects

[4] This notion is supported by Lea (1992: 17) who says that elites are not really interested in change at all because they already occupy privileged positions in the current system and so do not make genuine attempts to find out what poor people need.

independently. He says that the structural change required for them to achieve empowerment would necessitate them having power in the first place (Rigg 1991: 207). Those with power are unlikely to surrender it and this prevents genuine participation from taking place.

As it is unlikely that power will be surrendered so that local people can implement their own development activities, Rigg (1991: 208) suggests that village development programmes build on traditional village structures and power relationships, rather than creating new ones. Thai society is particularly hierarchical. Rather than trying to change this the suggestion is being made to work within its constraints.[5]

Additionally, Rigg says that 'bottom-up' and 'top-down' approaches to development are not mutually exclusive. Essential components of development activities such as new technology, education, modern health facilities, credit organisations and marketing structures do not usually come from the grassroots (Rigg 1991: 208). They require the stimulus of government agencies or non-government organisations. However, these programmes from above should then incorporate knowledge, information and participation from below. That is, there should be an exchange of information between the top and bottom (Rigg 1991: 208). Porter *et al* (1991: 208) support information exchange warning that outsiders should not think they know what is in the best interest of locals. They argue however, that local people can be wrong about their best interests. This error can result from incomplete information or political manipulation. Therefore, Porter *et al* see a need for cooperation in the planning and implementation of activities. It is not the case that success is directly proportional to the degree of participation and control of local recipients.

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[5] The hierarchical nature of Thai society is reinforced by Holloway (1989c) who states that such structures are embedded in most Asian societies. He says (1989c: 212) that in Asia the "gains from the harvest for the share-croppers, the interest rate for the money-lenders, the attitudes towards women and the respect for those who have power, all are old and accepted customs." He indicates that when the government initiates development programmes it does so via the existing hierarchy which serves to reinforce both this structure and loyalty to the government down to the village level, particularly amongst middle-level peasants who have a modicum of power.

The view that there should be a combination of 'top-down' and 'bottom-up' approaches is supported by Simpson (1991). With regard to agricultural development he says that for 'bottom-up' planning to receive funding and approval from central government it must also be a part of regional planning. That is, it must be of importance to the provincial level government (Simpson 1991: 1). Therefore, if projects involving a high degree of participation and involvement of local people wish to proceed unimpeded they must satisfy and be consistent with the plans of government.[6] With respect to particular roles, Simpson sees external agencies as initiators of appropriate technologies into a region. The role of government or non-government agencies should be to act as co-ordinators of activities and intermediaries between various local parties. Local people then have the major role in determining the basic nature of the activities included in the project so that these are consistent with their priority needs and desires. To incorporate these views Simpson (1991: 5) suggests using preparation projects that focus on, amongst other things, community participation during planning, implementation and evaluation stages. This ensures that the essential nature of the main development project is shaped not only by external agents but by intended recipients as well.[7]

Development projects initiated by central, regional or local government will not be able to implement activities which truly empower local people. By definition this would involve the sacrifice of some of their own power. Local people however, cannot easily initiate and implement their own programmes because they normally lack relevant expertise. Moreover, as

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[6] This is in order to achieve what Conroy (1988: 288) describes as political sustainability. It is necessary so that innovations can withstand destruction or usurption from local, regional and central elites.

[7] An apparently alternative viewpoint is expressed by Dove (1986). He challenges the validity of categorising the development process in a 'top-down' or 'bottom-up' manner with its associated assumptions as to what these terms encompass. Dove asserts that this type of analysis is a fiction created by development scientists. In reality there is no top and no bottom but merely a collection of independent parties acting in their own interests, of which the government is one (Dove 1986: 133). The reason so many development programmes are unsuccessful is that government assumes its position at the top to be correct and that the needs and desires of other groups are technical obstructions to be changed. When a conflict of interest arises and neither party is prepared to change (and often the poor cannot afford to change) then the programme collapses. By constructing development problems in this manner it is evident that what is needed is a return to a greater service function by government through which they can assist villagers and the presence of neutral parties with nothing to benefit from the particular activity who can act as intermediaries between the interested players. However, what is required by this construction is essentially the same as demanding a mixture of 'top-down' and 'bottom-up' approach, as this mixed system indicates that it is necessary for government to relinquish some of its power and interests and commence working together with local people in participatory arrangements.

they are starting from a powerless position their plans are particularly susceptible to opposition from local elites or individuals in government who may feel their privilege is threatened by the activity. Thus, a mix of 'bottom-up' and 'top-down' approaches is most appropriate. The ideas and desires of local people need the approval and protection of government or non-government agencies and the technical expertise that these bodies can provide. The difficulty then arises in determining how much participation is best and which agencies will help recipients without worrying that they will be dividing their own power. Absolute control from recipients is unrealistic because of the technical and managerial deficiencies in their knowledge and political vulnerability. However, if outsiders are playing the major role in the crucial phase of project initiation and conception there could be a real danger of irrelevance to the needs and desires of farmers and a lack of interest on their part.

2.2 Non-government organisations as intermediaries of a mixed approach to development

2.2.1 Reasons for the popularity of non-government organisations

It has been stated that for development programmes to succeed the participation of local people must be achieved. Local people may find it difficult however, to initiate activities, so they need to work together with external agencies. The question that arises is what type of agency is most suited to working with these local people? It has been mentioned above, and in the section on institutional and organisational constraints to tree-planting, that there may be problems when working with government agencies. These have included an absence of co-ordination between departments; a lack of sensitivity to local situations (often as a result of an over-bureaucratic structure); and a reluctance to surrender power. It is because of these and other factors that it has become popular to suggest that non-government organisations (NGOs) (also known as private voluntary organisations) are more appropriate agencies for the implementation of development activities.

There are numerous forms of non-government organisation. They can be differentiated according to the level from which they originate and operate. NGOs stem from both developed and developing countries. Within developing countries they originate from and focus upon national, regional and local levels. NGOs can also be differentiated according to the type of intervention they undertake. Duffield (1993: 369) indicates that they usually undertake one, two or all of the following activities: relief projects, small scale development projects and policy and/or institutional reform via lobbying. There are then variations in the character of NGOs. Some northern NGOs merely act as donors for local NGOs while others undertake intervention themselves. Similarly, at the local level there are variations between membership and non-membership organisations. Non-membership organisations tend to be staffed by professional or semi-professional staff, be they local or not, and compete with government or private organisations for the right to implement development contracts on the behalf of donors. They are relatively bureaucratic but are nevertheless motivated by a desire to help the poorest (Brett 1993: 272). Membership groups on the other hand tend to be entirely voluntary, more likely to be inspired locally, composed of the rural poor and less bureaucratic (Bebbington and Farrington 1993: 201). Uphoff (1993: 609) calls most membership groups Grassroots Organisations (GROs). Thus, there are northern and local NGOs and GROs. However, the boundaries between these different organisations are frequently unclear. Often international organisations operate at the local level and what seem to be local NGOs originate from the inspiration and spread of international organisations. Similarly, there may be a non-membership organisation with temporary voluntary workers or an entirely voluntary GRO that has become a professional NGO.

Theorists give numerous reasons for preferring NGOs as agencies suited to working with the rural poor in a participatory arrangement. They are asserted to have greater empathy for and understanding of the poor than government officers. This supposedly arises from a higher percentage of their staff coming from such backgrounds themselves and from a history of working with this group (Jazairy 1988: 57, Kaimowitz 1993: 1145). Furthermore, not only have NGOs worked with poor groups but they have worked with them using the participatory, 'bottom-up' approach that is now believed to be the best method for all agencies involved in

development (Lea 1992: 18, Clark 1991: 4-5, Streeten 1987: 92, Minear 1987: 97). They are experienced in the techniques that are now popular. Edwards (1989: 132) says that this tradition of encouraging participation and using decentralised decision-making means that NGOs are better at listening to and learning from local people than government and multilateral organisations. In addition to the participatory approach, NGOs have contributed to human development via the nature of their development process. Their major aim is not just innovation adoption but the development of recipients through the process of innovation. In addition to participation, NGOs have encouraged the strengthening of local rural organisations so that development can occur in their absence. They promote methodological innovations such as farmer-to-farmer dissemination so that technologies can spread independently even after they leave a village (Bebbington and Farrington 1993: 206-207). These institutional and methodological innovations promote the ultimate form of participation by making farmers entirely responsible for the future of any activity entering their communities.

Other claimed advantages of NGOs include their cost-effectiveness and lower overheads. These characteristics stem from their small scale, with many NGOs only being created for the sake of a particular programme (Streeten 1987: 92, Danenberg 1988: 69). Lewin (1988: 33) asserts that this cost-effectiveness also results from greater cost consciousness and fiscal discipline. A further advantage of the NGO method of organisation is its freedom from government and associated political constraints. This allows NGOs to act more effectively without compromise. Consequently, they can design their projects around reality and prioritize their objectives according to the needs of the poor rather than being constrained by policy (Holloway 1989b: 144, Francis 1993: 208). It also means that they are more able to identify and seek to reform political injustices (Lea 1992: 18). Finally, it is commonly believed that the NGO method of organisation is advantageous because NGOs more frequently use local resources (which the poor may already possess) and labour intensive technologies than their government counterparts (Holloway 1989b: 146, Lewin 1988: 33).

There are also advantages stemming from the character of NGO staff members. They are normally highly motivated and altruistic in their behaviour (Lewin 1988: 33). Holloway (1989b: 143) and Clark (1991: 53) also suggest that NGO staff are very committed not only to their work but to their belief in the beneficial social change that they are bringing about. Finally, NGO staff are said to be more innovative because of the fewer numbers involved in decision making, reduced scrutiny of their activities, apparently smaller consequences of their failure and the nature of volunteerism which encourages individual creativity (Clark 1991: 51).

The popularity of using NGOs to implement development programmes extends beyond theorists. They are gaining significant support from a variety of sponsors and national governments. Minear (1987) outlines the windfalls NGOs have received in funding that is indicative of their popularity. In the fifteen years from 1970 to 1985 northern NGOs (those of developed countries) increased disbursement to southern NGOs (those in developing countries) from one billion US dollars to four billion US dollars. Of this sum private contributions tripled from $0.9 bn (US) in 1970 to $2.9 bn (US) in 1985, and government co-financing increased eleven fold from $100 million (US) in 1970 to $1.1 bn (US) in 1985 (Minear 1987: 96).[8] These funding increases have permitted NGOs to increase the scale and effectiveness of their activities. Their independence has been enhanced not only by increased quantity of funding but because much of the finance comes via direct funding. That is, it comes straight from donors, usually the governments of industrialised countries or from donor NGOs in those countries, to local NGOs without being intercepted by local governments (Mills 1988: 20).

This influx of resources into the NGO sector has resulted in their numbers increasing dramatically. Clark (1991: 44) indicates that there are now over 500 development NGOs in the United States, more than 300 in Canada, approximately 100 in the United Kingdom and about 2,000 in all OECD countries. These work with some 20,000 southern NGOs which assist 60 million people in Asia, 25 million in Latin America and 12 million in Africa (Clark 1991: 44).

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[8] More details on the increasing financial support for NGOs is contained in Hellinger *et al* (1988: 99) and Brett (1993: 271). Burnell (1992, 1993) details the significant funding increases being experienced by British NGOs and assesses the future availability and direction of this funding.

NGOs are also becoming increasingly popular with the national governments of developing countries. To take just one example the Indonesian Minister of Internal Affairs supported local NGOs by saying,

> "Groups designed to develop community self-reliance are greatly needed in the community and government should support them because they share the same goal as government in wanting to raise the spiritual and physical well being of the life of the people in the field of achieving national goals." (Mylius 1987: 11)

This was said at a twentieth anniversary celebration of a local NGO in 1987. It was accompanied by statements to the effect that support for NGOs should not interfere with their autonomy but involve improved co-ordination between government agencies and NGOs to avoid duplication (Mylius 1987: 32).

The real reasons however, for the popularity of NGOs amongst donors and the national governments of developing nations may not relate to those advantages expressed by theorists. Donors are keen to shift emphasis to grassroots development because of dissatisfaction with larger scale government projects (Mills 1988: 21). Thus, support for NGOs may result from dissatisfaction with government service provision to the poor rather than recognition of NGOs' proven advantages. It is believed that centralized states are not good service providers because they are rigid, inefficient and corrupt. NGOs, in contrast, are believed to want to help people (Brett 1993: 270). Regardless of their approach, NGOs are believed suited to filling a gap in service provision which is left empty by state agencies and market forces, that is the servicing of the remote and the poor. It is also suggested that the reason for local and foreign government approval of NGOs is because they can subsidise state agencies by making it unnecessary for them to go into remote locations (Porter *et al* 1991: 140-141). Therefore, the popularity of NGOs stems not from their capacity to demonstrate and contribute to institutional reform but from their ability to subsidise government by helping in locations where the state has not been able, or not willing, to work.

2.2.2 The small projects method of NGO operation

In recent times the most popular way for local NGOs to assist in development has been through their own small projects. These projects have focussed on introducing innovations and ideas into disadvantaged communities using participatory approaches (usually with funding from and/or the direct involvement of Northern NGOs). They deal with the symptoms of rural poverty by making small but qualitative improvements to rural livelihoods. It is through these organisations and their method that tree-planting systems could be introduced to areas of need.

There are innumerable methods that NGOs around the world have used in their small-scale projects. Consideration here is given to the approach of the North American NGO, World Neighbours (WN). Their small project approach, aimed at improving rural livelihoods in specific areas, is consistent in different locations. However, the particular techniques that WN promotes vary according to different circumstances. WN operates projects in developing countries in addition to providing funding and advocacy services. When planning the most appropriate development activity WN normally identifies one or two innovations that respond to the limiting factor in local production (Chambers 1987: 7). WN also aims at the protection and management of common property resources, including forest, common pasture, rivers and the like, so that they can be used to improve the livelihoods of the rural poor. To do this they do not advocate policing, giving equitable access to nor privatising common property resources. Instead WN's approach draws pressure from these resources by providing local people with alternatives. These alternatives involve growing on private land what was previously taken from common land or generating better alternative activities to what was being done on the common land (Chambers 1987: 8-11). Therefore, their model introduces technologies that help to achieve these goals. By reducing pressure on common property resources, there are more resources available to groups, such as the landless, who would not normally be able to benefit from innovation adoption in the short term.

Chambers (1987: 12-18) identifies five methods by which NGO projects using a World Neighbours approach in India, Mali, Thailand, Nepal and Honduras have successfully achieved sustainable livelihoods for rural dwellers. The first technique is to use a learning process approach rather than a blueprint approach. That is, to learn from error and failure and change project objectives accordingly, even when the project is in process. Second, people's perceived needs must be identified and given top priority. This requires their participation in defining programme goals and processes. Secure rights and obvious benefits are also required so that people feel confident to adhere to the activity in the long term. The fourth method emphasises self-help and avoiding paternalism of all types. Nothing should be given away and no inputs subsidised. Villagers should only participate because they have seen that the activity can be successful (perhaps in demonstration models or farmer trials).[9] Finally, success requires a continuity of high calibre staff.

Chambers (1987: 20-21) asserts, based on the experience of NGOs using the above approach, that adherence to such a method leads to institutional spread. It results in the growth of the NGO and its activities or the adoption of its approach by other NGOs and/or government organisations. It can also lead to spontaneous or induced diffusion of technologies outside the project area. This is assisted by the priority given to people's critical needs which increases the relevance of innovations. It is also helped by the use of techniques such as farmer-to-farmer dissemination and the creation of farmer organisations.

Hellinger *et al* (1988) generate a similar participatory small project approach from analysis of an international NGO in Africa. They suggest project ideas should originate from grassroots organisations that work with poor communities. In the absence of these groups, NGOs should spend considerable time with the poor to assess their needs. Small projects should then strengthen local organisational capacity to assist recipient capacity in decision making and they should develop a plan to pass control of the project to these local

[9] Chambers qualifies this however, by saying that deeply impoverished people would be an exception to this method and would probably warrant the provision of some inputs.

organisations. Finally, Hellinger *et al* (1988: 171) suggest that salaries should be consistent with the nature of voluntary work and at least 25 percent of project costs should come from non-government sources.

It has been argued that the major constraints to tree-planting are institutional and organisational factors, in particular the 'top-down' nature of agencies responsible for their implementation. If this is the case then NGOs providing protection and technical expertise via participatory small projects may be best suited to the future promotion of tree-planting systems.

2.2.3 Problems with the small projects method

Many have warned that too much faith should not be placed in the small projects of NGOs. This is because their ability to encourage participation and development remains largely untested. Lele (1991: 615-616), noting the observations of Maniates (1990), says that the "Mainstream SD (sustainable development) literature blithely assumes and insists that 'involvement of local NGOs' in project implementation will ensure project success". Lele argues that involvement of local NGOs does not necessarily mean that the participation of local people will be guaranteed. NGO ability varies and not all are skilled in attracting genuine participation from the poorest.

Streeten (1987: 92) supports Lele's comments. He says that NGOs often do not live up to their claimed advantages. Frequently, they do not reach the poor as planned but reinforce the rule of the local elite. This may result from it being easier to get resource-rich groups to adopt innovations or from some other aspect of village structure. Danenberg (1988: 111) asserts that all of the NGOs sampled in his study, stated that community participation was an essential component of their strategies. However, none made internal assessments as to the success of this approach. They did not enquire as to whether their attempts at participatory development were really engaging the involvement of those people targetted. Without these assessments it is

difficult to ascertain whether NGOs really are the best institutions to promote development via participation and the problems they may have in advancing such an approach. Lewin (1988) and the Overseas Development Institute (1988) support this view, they say respectively that,

> "The qualities attributed to NGOs are largely based on impressions and beliefs. They have rarely been tested through evaluative research, and one cannot be sure whether they are myth or reality." (Lewin 1988: 33)

> "The conventional wisdom that NGOs are better than official agencies in tackling poverty, stimulating community development and providing disaster and famine relief remains largely untested." (Overseas Development Institute 1988: 45)

More objective analyses of NGOs' activities are required. In the past however, this type of work has been limited. There has even been reluctance to release or publish internal evaluations, unless they described successful events that could be used for promotional purposes (Clark 1991: 46).[10] Porter *et al* (1991) suggest that NGOs are reluctant to confess serious problems because they fear their funding from donors may be threatened. Alternatively, NGOs may not perceive a need for these evaluations or they may lack the capability to carry them out. Kaimowitz (1993: 1145) suggests local NGOs often lack the objectivity to recognize problems relating to their small projects (not just absence of participation), or they may lack the knowledge to solve them. NGOs may equate success with what is happening among recipients closest to the organisation but be unaware of the condition of the majority.

Clark (1991) asserts that objective analyses of NGOs that have been done, indicate NGOs also face substantial problems when trying to encourage participation amongst the poorest groups. NGOs may be successful at reaching the poor but have not yet objectively established that their activities actually reach the poorest (Clark 1991: 47). They are no different from official aid agencies in finding it easier to motivate people with some assets, confidence, skills and literacy. Cited by Clark, Tendler's (1982) evaluation of US NGOs provides

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[10] Supported by Bebbington and Farrington (1993: 204).

evidence that many NGOs have in fact moved away from a poverty focus to working with people who have some assets or marketable skills, however minimal.[11] Although not necessarily a failing (as there is at least a greater opportunity of 'trickle-down' from the poor to the poorest than there is from groups of higher status) this tendency illustrates that the benefits of the NGO method of operation are often purported rather than proven.

Further doubt surrounding NGO small projects concerns the presence of and testing for inefficiency, opportunism and corruption. Brett (1993) argues that these concepts have not been rigorously tested in the case of NGOs as they have been for state agencies. Investigations are needed to test whether the outputs of NGOs are commensurate with the resources they receive. Brett argues that participatory approaches may in fact jeopardise efficiency. However, Brett does not consider the view that NGO success should not be measured merely by their efficiency to provide services. This gives too much importance to physical development over human development. A participatory approach may consume time and decrease efficiency in service provision. By involving recipients directly however, they benefit from the process of development as well as the outcome. This contributes to their self-reliance and empowerment, essential components of human development.

Nevertheless, Brett argues validly that there is a need for greater accountability in NGO small projects. Brett (1993: 293) says that participation gives recipients little real control or authority over local NGOs in terms of monitoring for efficiency, opportunism and corruption. Genuine control of the agency remains with donors. Brett suggests that recipients would have better control if donors relied on local community groups (perhaps GROs) to provide services. However, donors would then be distant from the organisation providing services (promoting activities) and recipients may still be unable to ensure that these service providers are accountable to their needs. Some recipients may be included in service provision (the GRO

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11 Tendler J., 1982, **Turning Private Voluntary Organizations into Development Agencies: Questions for Evaluation**, Program Evaluation Discussion Paper No. 12, Washington D.C. USAID, April 1982. Tendler's study of NGOs originating from the USA was based around 75 project evaluations. It indicated that many projects do not include or benefit the poorest 40% of the population.

staff), but their privileged position in the GRO may distance them from the larger community. This is highly likely in communities with strong patron-client relationships.

There are still further problems with the participatory small projects of NGOs generally and with the suitability of these projects for the promotion of tree-planting systems. A general problem with NGO small projects relates to their replicability, given the nature of NGO leadership, staff and project scale (identified by Michael Cernea and recorded in Holloway 1989c: 215-216). It is often asserted that NGO project success is due, wholly or partly, to the outstanding leadership of a charismatic individual. Without leadership of a similar ilk, it is impossible to replicate the successful project. Indeed a successful project may be unable to maintain itself if it loses a charismatic founding leader. Similarly, it is often difficult to replicate the qualities of NGOs' highly motivated staff. Moreover, the impact of the NGO approach is often limited by the independent, small and localized nature of their projects. This results from them being isolated from other NGOs and hinders the establishment of effective country-wide or region-wide programmes (Holloway 1989c: 216).

NGOs are also constrained by the minimal technical expertise of their staff. NGO projects often suffer from limited technical feasibility analysis and weak databases because of insufficient technical, managerial and/or economic skills (Holloway 1989c: 216). Consequently, NGOs are limited in the services they can provide and hence, do not always meet farmers' felt needs. Alternatively, they may be unable to act on feedback they receive from farmers via their participatory approach. Kaimowitz (1993: 1146) argues that NGOs select staff with low levels of formal education, often from recipient communities. This limits their capacity to use complex methodologies and practices. It also constrains their ability to overcome problems as they emerge (project adaptability). Staff of this type are chosen to increase rapport with ordinary farmers, so that traditional knowledge and recipient concerns can be accessed. Kaimowitz suggests however, that this farmer knowledge is overrated. It cannot be incorporated into projects without systemization that NGO staff are unable to carry out.

There are also doubts surrounding the freedom of NGO staff from policy burdens. Brett (1993: 284-285) says that in reality NGO staff are not freed from the policy of their own organisations and this limits their behaviour. Staff of most NGOs are motivated by altruism. However, in order to devote sufficient time to their activities they must get a reciprocity 'wage' from their organisation. Receiving a payment means that NGO staff are bound in a contract to perform particular services, be that contract with the local NGO hierarchy only or with donors. As a result of this contract they are not free from policy. NGOs contain formal bureaucracies with all of the constraints these place upon individual freedom and creativity.

A final problem arises from the nature of constraints to tree-planting systems. Even if NGOs could implement these activities in accordance with recipient desires, it is unclear whether they could do so effectively using small projects, given the strength of economic and resource, policy and socio-cultural constraints. It may thus be necessary for NGOs to engage alternative or additional methods, in order to smooth the path of tree-planting systems.

2.2.4 Alternative methods of NGO operation

To overcome inherent problems in the NGO small projects participatory approach and its specific problems in relation to tree-planting systems' implementation, it is necessary to consider alternative methods of NGO operation. There are numerous opinions on more effective ways NGOs could operate.

With particular concern for the problems of replicability and technical deficiencies, some have suggested that NGOs should develop stronger linkages with government agencies. NGOs can gain a spatially larger area of influence by coordinating their activities with official programmes. They can also overcome technical deficiencies by tapping into government sources of skills. The exact nature of an NGO relationship with the state is a matter of varying opinion. The Indonesian Minister of Internal Affairs referred to the optimal role of NGOs in his

country as one of complementing government activities. They should plan activities in those areas not reached by the state (Mylius 1987: 31). This avoids duplication and interference by NGOs in government programmes. It also means NGOs provide services in areas of genuine need not yet serviced by the state. Therefore, small projects continue but they are coordinated with government. Kaimowitz is another who suggests that in collaboration with government, NGOs should retain their small projects. He recommends that they develop closer ties with research institutes to enhance their technical capacity (1993: 1147). Kaimowitz also suggests that NGOs reciprocate technical information with these agencies by sharing their participatory methodologies, perhaps via NGO staff acting as consultants to these research bodies. This would lead to institutional reform in these agencies. Bebbington and Farrington (1993: 213) suggest that the incorporation of NGO methodologies such as participation, organisational strengthening and technology dissemination into government agencies is extremely valuable and should be an aim of NGOs. They admit that this task is not easy but it could be done by NGOs giving training courses to government staff or state agencies hiring NGO individuals to do preparatory work for government projects. Therefore, these views suggest that NGO small projects should continue but they should develop closer links with government. This increases NGOs' technical capacity and their ability to reform the methodologies of state agencies, thereby assisting the replicability of the NGO approach. Bebbington and Farrington (1993: 215) imagine that eventually there may be specialisation amongst local NGOs. They may act as applied research centres, rural development consultants contracted to government programmes, or continue to engage in project implementation.

Clark (1991: 79) places greater emphasis on NGOs pressing for reform of government rather than carrying out small projects that may only alleviate the symptoms of poverty. Northern and southern NGOs should take on advocacy roles whereby they demand pro-development reforms from powerbrokers. Clark agrees that NGOs can do this by joining with government in mutual activities. He recommends however, that NGOs take a stronger stance also by lobbying government agencies from the outside. This lobbying does not have to be done by the same organisations that are working with government. Lobbying is a better role for

international, northern NGOs while local NGOs continue working with government on the ground. Nevertheless, in some instances it may be more effective for local NGOs to engage in lobbying as well.

Holloway (1989c: 217-218) also believes that the most valuable method of NGO operation is in cooperating with and lobbying government for genuine reform. He thinks NGOs should concentrate on the following actions. First, they should help local people find political space from which they can help themselves and achieve empowerment without being opposed by the elite (that is, selecting politically sustainable development activities). Second, NGOs should identify alternative institutions for passing resources to the rural poor and attempt to introduce these systems to government (this idea may need testing in small projects). They should then persuade governments to modify programmes that disadvantage the rural poor. Finally, NGOs should encourage governments to change their thoughts and actions by introducing government to new ideas and building up sympathizers to the rural poors' condition.

Another view sees value in NGOs operating independently but avoiding small projects. Brodhead (1987) says that the best role for NGOs is to act as bridges between the rural poor and existing institutional support. This means NGOs should concentrate on linking landless farmers to bank credit or government subsidies, or perhaps get legal aid to those suffering from exploitation (Brodhead 1987: 4). By not having their own small projects the service provided by NGOs is not restricted by their limited technical capacity. They can devote their energies to the identification of farmers' felt needs and then direct farmers to existing services that can satisfy these needs. The view of an FAO/FFHC article (1987: 100) asserts that NGOs do not have a purpose in themselves but instead exist in function of the social sectors that they intend to serve. The only consistent approach of NGOs, according to this belief, is that of encouraging participation, as participation is the force that tempers the organisation's form. In this sense, NGOs that merely identify farmer needs and then access relevant services are far more adaptable to the changing needs of recipients than NGOs that engage in small projects only to be constrained by the programmes they have planned and the bureaucracies they have created.

In relation to the promotion of commercial tree-planting, Godoy (1992) agrees with the above by stating there is no need for small projects from either NGOs or state agencies. Farmers will innovate on their own if there are suitable commercial incentives and no policy barriers. Godoy argues that agencies wanting farmers to plant trees need only concentrate on untangling market distortions, directing farmers to new technologies and listening to farmer needs (1992: 722). However, Godoy describes very specific circumstances. If the promotion of trees for agroforestry purposes or subsistence is desired, or if promotion is designed to help disadvantaged groups, such as the poorest, then greater intervention may be justified.

2.2.5 Comments on the alternative methods of NGO operation

Although the views above have devalued the role of small projects, these projects continue to be useful in some circumstances. The value of small projects lies in their ability to support other approaches, especially lobbying. Small projects, although not always effective in themselves, provide useful training grounds for testing and proving the advantages of participatory approaches. They 'ground' the experiences of NGOs giving them greater credibility when they refer to these experiences in the act of lobbying. Moreover, by increasing the economic security and independence of local people, small projects heighten people's confidence and political power. This makes it more likely that their lobbying efforts will be successful. Therefore, emphasis on lobbying does not detract from the need for small projects. Furthermore, the minimally interventionist approach advocated above may be inadequate when promoting tree-planting for subsistence and when promotion amongst the poorest is important. Similarly, accessing existing services is only possible if those services indeed exist.

Greatest concern with the alternative approaches cited however, relates to the call for NGOs to collaborate with government. With regard to NGO/government collaboration, Holloway (1989b: 159) argues that an NGO's approach cannot easily be transferred to government, which has a tendency towards thinking and operating at regional and provincial levels.

Additionally, it is not only the techniques used by NGOs but their direction of them towards helping the rural poor that is crucial. Consequently, the aims of NGOs may not be met by the transference of their techniques to government unless the latter also changes its focus towards the rural poor. Therefore, collaboration does not guarantee replication because government is often unable to set up projects with a rural poor focus.

Another concern with NGO/government collaboration, particularly in relation to working together on joint projects or exchanging staff, relates to the effect this may have on the NGO and its staff. NGO advice to state agencies may well enlighten the latter as to the condition of the poor and inform them of participatory approaches. However, this collaboration may also distance NGOs from recipients and decrease the participation in their approach. Porter *et al* (1991: 166) indicate that collaboration in Magarini made NGO staff spend more time executing procedures and observing the time lines of their schedules, rather than observing the conditions of project communities served. NGO staff had to align with the priorities and criteria of the larger organisation that they had joined.

A further problem with NGO/government collaboration concerns the terms under which states involve themselves in such relationships. Depending on the prevailing form of government, states may be unwilling to collaborate with NGOs (discussed by Walters 1993: 6). Alternatively, states may be prepared to collaborate but have differing expectations of relationships from that of NGOs. They may wish to curb NGO freedoms and retain control over joint activities. Government attraction to collaboration is often unrelated to the opportunity of learning participatory approaches. States are more interested in NGOs and their foreign donors subsidising service provision in remote areas (Duffield 1992: 368). Therefore, states are more comfortable granting NGOs a place as additional service providers, rather than radical innovators of a state's own institutions.

Many of the advantages that NGOs' possess come from their independence. This could be compromised by close association with government. As Clark (1991: 65) states, progressive

NGOs are inclined to see government as part of the problem. To help the rural poor major changes need to occur in either government policy or action. Collaborative ties could jeopardise the ability of NGOs to demand this change. NGO staff may be restricted from openly lobbying government or protesting its policies in order to preserve the collaborative agreement.

There are therefore, many risks associated with collaboration. It could limit NGO independence and it may negatively influence an NGO and its staff away from participation. The success of collaboration could also be limited by government interpreting a relationship as one of service provision only and the reluctance of state agencies to adopt a rural poor focus.

Threats to NGO autonomy can result from collaboration with government but they can also eventuate from an NGO's funding relationship. As indicated by Minear (1987), direct funding to local NGOs from developed country NGOs and governments has increased substantially. Additionally, local NGOs often receive generous funding from their own governments (Streeten 1987: 92). There is concern that NGOs could become dependent upon these funds as they create large bureaucracies to absorb increased finance. This dependency would give donors a measure of control over the agencies making them less responsive to the needs of the poor. NGOs with large bureaucratic structures could be controlled by donors threatening reduced finance if donor goals are not achieved. Moreover, NGOs may be disinclined to lobby and take up advocacy roles if it involves direct confrontation with donors.

There is also concern that NGOs could be turned away from a rural poor focus as a result of increased funding from developing country governments. As many developing country governments see NGOs merely as filling gaps in service provision and as implementers of projects conceived by the state, so funds have been restricted to NGOs performing these functions. This has led to the emergence of NGOs that can be described as Public Service Contractors (PSCs) (Brett 1993: 294, Duffield 1992: 370). PSCs are created to take up rural development contracts made available by funding. This mercenary nature leads to doubt over whether PSCs can perform important NGO functions such as advocacy and placing the rural

poors' needs over state or donor interests. Moreover, PSCs may be more inclined to conceal failures because of their priority towards securing and maintaining funding (Brett 1993: 294).

Proliferation of direct funding from western donors to local NGOs also causes concern. Developing country governments may see this form of direct funding as deliberate attempts to bypass the ordinary channels of government and disrupt the internal affairs of their countries (Mills 1988: 21). This may then generate opposition against NGOs from their own governments who see them as the pawns of foreign donors. A final concern with direct funding is that it may provide NGOs with resources that are beyond their capacity to manage (Mills 1988: 21).

Many solutions have been suggested to avoid problems associated with funding. To overcome the crucial autonomy issue, Drabek (1987: xiv) suggests NGOs diversify their sources of income and not be dependent upon any one. It is also desirable if local sources can be accessed, if not immediately then in the long term. Having improved the livelihoods of local people, NGOs can encourage them to pay for additional services, so that the organisation can continue to help them with more advanced needs or so that it can turn to help others. NGOs in the Philippines have concentrated on economically profitable activities in recognition of the importance of achieving independence from donors. To improve their management of these activities and their internal affairs, Philippine NGOs have therefore, turned to the business sector for knowledge and skills (Callanta 1988: 51). Finally, to quash worries that direct funding may interfere with internal affairs of developing countries, Van Dijk (1987: 119) recommends a 'tripartite consultation' between developed country NGOs or donors, official government agencies in recipient countries and local NGOs. These should be used to express concerns and intentions regarding the funding of programmes so as to avoid conflict.

2.3 Conclusion

The description of constraints to tree-planting stressed the importance of institutional factors in determining the successful implementation of these activities. It was then stated that

an alternative institutional approach should be taken and a different type of organisation tried to enhance the adoption of tree-planting. A better institutional approach would emphasise the participation of intended recipients in the process of introduction. Institutions best suited to co-ordinating this approach were thought to be non-government organisations. They have experience in encouraging participation and other benefits arising from the characteristics of their staff and structure.

However, the ability of NGOs to use participatory approaches successfully when promoting innovations remains untested and largely theoretical. There are possible problems with the structure of NGOs (from staff relationships to funding agreements) that may affect their capacity to secure participation and conduct projects successfully. Furthermore, the ability of NGOs to use participatory approaches when promoting tree-planting is particularly uncertain. NGOs may be able to encourage participation but not so far as getting people to participate in tree-planting. This may be due to the strength of constraints to that activity.

The rest of this thesis observes the activities of a particular NGO that is encouraging shifting cultivators to adopt tree-planting for development via a participatory approach. This NGO's ability to use such an approach, and any problems that it has, will be revealed. Problems may arise from the physical, cultural, political or economic environments, from the character of the tree-planting innovations promoted and/or from flaws in the NGO's structure and its chosen mode of operation. Observing this NGO will indicate whether constraints to tree-planting really are institutional and hence whether NGOs are best suited to overcoming them. It will also suggest whether the involvement of NGOs constitutes a sufficient change in institutional structure to permit tree-planting innovation.

CHAPTER 3

OBJECTIVES AND METHODOLOGY

3.1 Origin of the research topic

The research topic was inspired by previous experience in the Indonesian province of East Nusa Tenggara (NTT). It was strongly influenced by this region's environmental and developmental problems and its people's priorities. Dependence on shifting cultivation by NTT's rural population has led to much deforestation and land degradation. From 1982 to 1990, NTT and East Timor together suffered a deforestation rate of 14,000 hectares per year (Potter 1993: 108)[1]. In 1985, degraded land constituted thirty-seven percent of the total land area. In 1987, sixty percent of the forest area (the target of shifting cultivators) was degraded (Soemarwoto 1991: 213). Degradation was caused by population pressure that drove farmers onto heavily sloping lands and forced them to shorten fallow periods. Together with a short wet season, this land degradation has undermined the security of the entire livelihood system (Barlow and Gondowarsito 1991, Manuwoto 1991). Although NTT's population is insignificant in comparison to that of all Indonesia, it places significant burdens on the resources of the province (Fox 1977: 6). More than 80 percent of NTT's population was still in the agricultural sector in 1985 (primarily dryland shifting cultivation). Limited opportunities exist for off-farm employment in other sectors due to a lack of high density population centres. Consequently, most people cannot reduce their short to medium term dependence upon agriculture (Corner 1991: 47, Booth 1991: 54). Therefore, to help the majority of the population the agricultural sector must be intensified (Fernandez M.S.O. 1991).

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[1] Although this rate is low by Indonesian standards it is substantial in NTT where deforestation has occurred over a long period of time and there is little forest area remaining.

In NTT it has been widely suggested that the intensification and improvement of the agricultural system should be done via the adoption of tree-planting technologies (MAB Indonesia 1990: 23, Ayre-Smith 1991: 88, Duggan 1991: 37, Moffat 1991: 205, Pellokila, Field and Momuat 1991: 135, Datta 1993: 21). To date however, tree-planting attempts in NTT have not been smooth. Traditional reforestation activities and efforts to establish modern tree-planting systems have frequently failed. Failure has sometimes been attributed to biophysical constraints, such as the province's aridity. Ingrained socio-cultural factors are seen to be another source of failure. These include the tendency of farmers to burn grasslands to stimulate livestock feed and the habitual release of livestock for unsupervized grazing. The latter means livestock roam across the grasslands damaging trees that have been planted. Perhaps however, blame has frequently been cast on climate and the behaviour of traditional people because these are variables for which formal agencies cannot take responsibility.

Theorists, practitioners and policy makers, both within and outside NTT, have held that tree-planting systems incorporating agroforestry technologies and social forestry principles are essential to overcoming the province's worst environmental and developmental problems. An initial, broad objective of the research concerned how the implementation of tree-planting systems could be enhanced. As the research concerned the field of development, it was important to focus on an issue of relevance to people in the study area, rather than just being related to the current position of disciplinary knowledge. In the same manner that effective development projects are said to incorporate recipient participation, research in the development area should encourage the participation of the research subjects, both in determining the nature of the study and in obtaining benefits from it (Webb 1982, Edwards 1989).

The initial research topic was modified by the literature review and by further communication with local people in the study area. The literature emphasised the importance of NGOs. It indicated that NGOs using particular approaches would be more likely to enhance tree-planting adoption. This led to the search for, and consequent identification of, a suitable NGO in NTT. A one-month visit to NTT early in the research period, before the aims were fully

determined, allowed communication with this agency. Permission was sought from the NGO to conduct the research and the NGO's own desires for information were identified. Attempts were made to incorporate these into the study. It was felt for example, that the NGO's desire to know more about farmers' use of forest products could be given attention in the research's analysis of constraints to adoption.

Therefore, the research topic was inspired by the major environmental and developmental problem of East Nusa Tenggara as perceived by outsider and local theorists, practitioners and policy-makers. It was formed and modified through a process that examined the relevant literature and heard the desires of those people who would be the subjects of the research.

3.2 Research objectives

The initial, guiding objective was to discover how tree-planting adoption could be enhanced in semi-arid upland environments. Relevant literature emphasised the importance of encouraging recipient participation in tree-planting projects and the ability of NGOs to secure this participation. There was however, little evidence of the actual ability of NGOs to encourage participation, especially when promoting tree-planting systems. The revised guiding objective therefore, was to investigate the ability of NGOs to promote tree-planting systems via participatory approaches.

Two specific aims were devised to fulfil the guiding objective. The first was to analyse the type of participation achieved by an NGO that intended using this approach when promoting tree-planting systems. This analysis was to focus on identifying and describing factors within the NGO's structure, or external to the organisation, that either permitted or obstructed participation. The second aim was to examine the 'quality' of adoption that the NGO had achieved with its intended participatory approach. By anlaysing both the NGO's participatory

approach and the nature of adoption a better idea could be obtained of how NGO's promote tree-planting. If the NGO's approach was participatory, an idea of particpation's potential would be revealed by comparing it to the quality of adoption achieved. Alternatively, even if the level of participation was low, high quality adoption of the technology would indicate that the NGO had used an effective alternative approach that needed further investigation. Moreover, careful examination of the actual approach used and the nature of adoption would either reinforce or review the importance of those factors traditionally constraining tree-planting. Table 3.1 (overleaf) summarises possible conclusions as to the role of NGOs and the importance of participatory approaches and constraints to tree-planting that can be derived from analysis of the relationship between participation and quality of adoption.

3.3 Research approach

3.3.1 Case study of one non-government organisation

To fulfil the research aims the study focussed on the activities of Yayasan Tananua (YTN) in the district of Paberiwai in the East Sumba regency, East Nusa Tenggara province, Indonesia. A major part of YTN's rural development programme was the use of a participatory approach to promote tree-planting. In 1992 there were 101 separate, local NGOs throughout NTT. Sixty-one of these aimed to improve dryland agriculture and 20 were interested in tree-planting (WALHI 1991, BKKKS and OXFAM 1992). Consultation with academics and NGO personnel and a seminar on agroforestry at Kupang's Agricultural Polytechnic revealed however, that YTN was one of the few NGOs to have promoted tree-planting for any length of time. Most other organisations had not had an opportunity to establish noticeable adoption levels. Moreover, YTN was the only NGO to have promoted tree-planting on all of the three main NTT islands of Sumba, Flores and Timor (although its activities were centred in Sumba and those on Timor had only just commenced). It had also built up a significant reputation for both its success in encouraging tree-planting and its use of participatory approaches. It was suggested

Table 3.1: Implications for the role of NGOs, participatory approaches and constraints to tree-planting when particular observations as to participation and adoption emerge

Observation as to,		Implications for,		
Degree of Participation	**Quality of Adoption**	**NGOs**	**Participatory Approaches**	**Constraints to Tree Planting**
High	High	Are capable of using participatory approaches to promote tree-planting.	Are important in the adoption of tree-planting.	Can be overcome by participatory approaches.
Low	High	Have difficulty using participatory approaches; they have used other approaches to promote tree-planting; these should be investigated.	Are unimportant in terms of promoting tree-planting which can be achieved in its absence; necessary to examine whether other approaches have all of the advantages of a participatory approach (eg: do they facilitate human development?)	Perhaps cannot be overcome by participation thus necessitating other approaches.
High	Low	Are capable of using participatory approaches but their use has not resulted in the adoption of tree-planting.	Are unable to overcome constraints to tree-planting that discourage adoption.	Cannot be overcome by participatory approaches; need to be identified so that strategies for overcoming them can be devised.
Low	Low	Are unable to use participatory approaches and have failed to promote tree-planting.	Are perhaps important to tree-planting; a firm conclusion can only be reached after it is established that low quality adoption is a direct result of participation's absence, rather than other constraints.	Need to be identified so that it can be determined whether low quality adoption resulted from absence of participation or the effect of other constraints.

that the activities of YTN had been real and effective. In contrast, the activities of other NGOs were said to exist in reports but were nowhere to be found on the ground. YTN's experience was so impressive that there were plans amongst donor organisations to replicate its model in other areas both within and outside Nusa Tenggara (Fisher *et al* 1993: 21).

Given YTN's importance in the region as a model for other NGOs and the absence of other agencies with equal experience, the research was restricted to a case study of this one organisation. This decision was further influenced by the difficulty of the terrain in which YTN operates and the vast number of villages it serves over a wide, isolated area. At the beginning of the data collection period YTN was attending 13 villages and had recently begun activities in another five, in East Sumba alone. Each of these villages had populations of around 1,000 to 1,500 people. The study was also restricted to the one organisation because of the importance of obtaining a deep understanding and description of its structure that could explain its ability to encourage participation. Similarly, it was essential to thoroughly understand the local conditions in which YTN was operating so that any constraints to the adoption of tree-planting could be identified. It was only by spending time with YTN staff and with villagers that a rapport could be established and such understandings reached.

Although YTN has operated in the Ende region of Flores for less time and has activities in just five villages in that area, some comparison with YTN's experience there was contemplated. These plans were cancelled however, when a disastrous earthquake in December 1992 killed 2,000 people and caused much property damage in and around Maumere and Ende. This destroyed and/or distracted farmer interest in ordinary YTN activities, changed YTN's programme to one of disaster relief, altered the expectations of residents towards foreigners and meant that travel between and residence in these areas would have been even more difficult than usual.

3.3.2 Assesssment of participation, adoption and the context of innovation

a) Assessment of participation

Description of the type of participation used by YTN was an essential part of the case study. The framework developed by Cohen and Uphoff (1980), outlined in Chapter 2, which determined the degree of participation in development programmes, was used to focus the study of the NGO's activities. Recipient participation in YTN's activities was thus described by:

a) identifying recipient and non-recipient perceptions of their greatest needs and problems, generally and in relation to trees, and then observing whether YTN's programme was addressing these priority needs and problems, as this would indicate the level of farmer participation in programme planning;

b) identifying whether recipients followed organisation meetings, how often they met with NGO staff and in what setting, what issues they discussed, and if they performed duties for the NGO themselves, as this would indicate the level of farmer participation in monitoring and evaluation;

c) investigating the nature of recipients' requests to YTN to follow the programme, as this would indicate farmer participation in programme conception in their locality and whether involvement was coerced or voluntary, and

d) observing the living conditions and productive capacity of both recipients and non-recipients so that the involvement of particular socio-economic groups in reception, conception and planning, monitoring and evaluation and as staff could be determined.

b) Assessment of the quality of adoption

Another essential component of the case study was assessment of the quality of adoption by those considered to be recipients. Observation was made of which and how many facets of the programme recipients had adopted together with the degree to which they were using each adopted technology to its maximum potential. The sustainability of adoption was

also accounted for in this concept of quality by observing recipients' attempts to develop technologies or ideas received, or to sustain innovations without external involvement.

c) Assessment of the context in which participation and adoption are occurring

Examination of YTN as a case study allowed a holistic approach to be used. Considering the entire context in which YTN's programme was conducted meant that unforeseen factors that may not have been expected to have any importance according to theory, would be revealed, if in fact they had an impact on the type of participation achieved or quality of adoption occurring. Holistic or systems approaches of this type are based on the principle that in agricultural systems, factors initially believed to be mere side-effects can actually have large impacts and obstruct interventions into the system if they are not taken into account, due to the dependent relationship of all components constituting such systems (Conway and McCauley 1983).

The holistic approach thus considered the varying impact of all factors appearing to constrain and promote YTN's tree-planting technologies. These factors were unveiled by examining the general conditions of recipients and non-recipients in both programme and non-programme locations and by identifying significant differences between them which may encourage or discourage tree-planting. There was also analysis of the Sumbanese history of tree planting and usage, and their current perceptions of and uses of trees on private land, communal land and forest. In terms of analysing factors that influenced the NGO's ability to achieve participation, particular attention was given to institutional and organisational aspects of the NGO. These included the nature of its staff, their origins, motivations and problems, the nature of its relationship with donors and its relationship with government and other organisations in the locality.

3.3.3 Reciprocal approach given demands to be made upon respondents

It was stated above that research in the development field should be participatory, by relating to issues that local people find important. It should also afford some immediate benefits to those people who are the subjects of the research, not only in its results but in the manner in which it is executed. These principles seemed to take on even greater importance after it had been decided that a case study was the best means of meeting the research objectives. A case study would make significant demands in time and information on both the NGO and farmers. Consequently, there had to be some reciprocation of information and advantage back from the researcher to the respondents. It would be unethical to conduct a research project which has obvious advantages for the researcher's academic discipline and institution and the researcher personally but not the local people studied, given the disruption to these people caused by the project. Such disruption may seem insignificant to the researcher, but is a massive burden given the respondents' means. This situation however, commonly arises because researchers are, in reality, only answerable to their sponsoring institution and discipline. As these institutions neither demand nor reward reciprocation of immediate benefits to respondents, researchers have little incentive to make such efforts.

This study attempted to address this need for reciprocation by making some direct contribution to local people while conducting the research. Efforts were made to give regular updates of the researcher's activities, methods used and preliminary results to the NGO and others who could utilise this material. By developing a close relationship with YTN this information was transferred at quarterly farmers' meetings and in private discussions with YTN staff and farmers (which served an additional purpose of allowing farmers and staff to challenge preliminary results, thereby helping identification of inaccuracies). YTN was also consulted as to how the research could be executed so as to cause minimal disturbance to its staff and local farmers. It was decided that this could be done by careful timing of visits and adequate notice of the researcher's arrival, both of which could be facilitated with assistance from YTN. This basic desire to share the research experience with local people was further enhanced by using

simple methods of data collection and analysis, thereby producing simple results that were easier to understand and more immediately useful, than complex methods and abstract results.

3.4 Methods of data collection

3.4.1 Data collection techniques used at national, provincial, regional and district levels

a) Collection of secondary data

The search for secondary data relating to YTN, the region in which it was operating and the experiences of other NGOs in that area, was an initial and ongoing data collection task. These data were sought from University and national libraries in Australia, from the Indonesian Forestry Department's library at Manggala Wanabakti in Jakarta and from other agencies at the national, provincial and regional levels in Indonesia, including WWF, WALHI, Bina Swadaya, the Nusa Cendana University's research centre library, BAPPEDA, BANGDES and the statistics office. Secondary data were also acquired from YTN itself and from its major donor in the USA, World Neighbours.

b) Data collection from key persons

At the provincial level discussions were held with key persons with some knowledge of the topics of interest. These included academics from the Catholic University of Kupang who had recently done research for NGOs in Timor and Sumba, staff involved in the promotion of tree-planting technologies and NGOs from the Agricultural Polytechnic at Kupang, staff of the NGOs Bina Swadaya and WALHI, and fieldworkers from the provincial horticultural department responsible for testing new tree varieties.

At the regional level, key persons identified were members of the regional government of East Sumba. Information was sought from members of the Office of Regional Planning (BAPPEDA), Village Development Office (BANGDES), Statistics Office, Agriculture Department (including its Food Crops, Agricultural Extension and Horticultural divisions), Estate Crops Department, Forestry Department and Department of Social Welfare. The regional rather than provincial offices of these agencies were focussed upon because of the latter's very minimal knowledge of the research area in the Paberiwai district.

Discussions with regional agencies concerned background information about the research area, tree-planting and the NGO, and officials' opinions as to variations between different households and locations in Paberiwai. This information helped determine which villages in the study area to focus upon. It also provided an insight into who was of greatest need and where they could be found. This would be useful in determining the type of participation YTN was using.

Two methods were used when approaching key persons from regional government agencies. First, a questionnaire obtained information about the relative conditions of villages in the two districts of Paberiwai and Tabundung. Attempts were made to present this questionnaire to various people in each government department. Few officials however, were able to respond because most regency level officers did not have intimate knowledge of the particular villages in these two most isolated districts. Consequently, the questionnaire was distributed only to those few officers with such knowledge (mainly people born in the two districts) and it provided only a minimal qualitative background to the relative position of need. Informal interviews were the second method used. This method was also constrained by officials' lack of experience in the planned study area. Nevertheless, interviews remained flexible and concentrated on what respondents did know. During interviews, schedules were often modified to be consistent with their knowledge, focussing far more on the general situation and looking at the role of the respondent's own department and its relationship with the NGO, village communities and tree-planting activities, rather than on the specifics of village

conditions. The planned questionnaire and question schedules for informal interviews with government officials are contained in Appendix A.

In Kananggar, the capital of Paberiwai district, informal interviewing of key persons was continued. Discussions with staff from district government dealt with similar issues as had been pursued in interviews with regional officials. Fortunately, much more detailed information was available from this level of government. As Kananggar is also the seat of the rulers of the traditional kingdom of Mahu (represented geographically by modern Paberiwai) it was important to become familiar with the Camat and other families in this influential community in the centre of the study area. These families, as well as being sources of information, were essential to increase the researcher's approval in and familiarity with the region.

c) Data collection from YTN key persons

Key persons in YTN were also a source of information. YTN was revisited continually before and throughout the data collection period so that progressively more sensitive information could be obtained as familiarity between the researcher and organisation staff increased and as the researcher's own knowledge of events exposed new areas of interest. As stated, preliminary contacts with YTN centred around the organisation's research needs and how research activity could minimise disturbance to farmers, and be of use to them. Initial visits during the main period of data collection, which included private meetings and attendance at a quarterly farmers' meeting, also collected restricted information regarding general background of the area and the nature of YTN's participatory approach. It was not until the fourth meeting with YTN's programme coordinator that more difficult and sensitive questions were asked about the organisation's affairs. This interview of YTN's programme coordinator was informal and semi-structured. A question schedule was used but tangential issues brought up by the coordinator were articulated. The exact question schedule taken into the interview is included in Appendix A. The question schedule was created before entering the field. It was modified after observations at farmers' meetings and other experiences in the field. For example, the question

regarding the youth of YTN farmer extensionists emerged after observing them at the farmers' meeting and then considering that this factor may be important in explaining staff motivation.

3.4.2 Selection of study villages

After collecting secondary data and interviewing key persons, sufficient knowledge of conditions in Paberiwai had been obtained to allow the selection of six villages in that district as study villages. These villages had a total population of about six thousand people. This number of study villages was necessary because the research was a case study of the NGO not of a particular area. Six villages allowed observation of the NGO in its full range of circumstances. Upon hearing the comments of government and NGO staff and seeing secondary data, the villages in Paberiwai were roughly ranked according to their development need. The six villages selected are shown in Table 3.2 together with their status of relative need in the district and nature of adoption of YTN activities.

Table 3.2: Relative need and status of adoption of YTN activities in the six study villages

Name of Study Village	Relative position of need	Natue of adoption of YTN activities
Meorumba	IN need	NOT adopting
Praimbana	LESS in need	NOT adopting
Praibokul	LESS in need	Adopting
Katikuwai	IN need	Adopting
Katikutana	IN need	Adopting
Wanggameti	IN need	Adopting

Note: Relative need at the village level was assessed by comparing data in the Potensi Desa reports concerning numbers and type of livestock possessed, education levels, area of wet rice agriculture, crop yields, tree products sold and accessibility of the village to market and a main road. It also relied on the opinions of officials as to relative need that were obtained during interviews.

Using variations in need to identify study villages was done with the view that villages most in need should be selected by YTN if it was aiming at genuine development, and any discrepancies needed explanation. Three adjoining villages were selected in the one category of villages 'in need, adopting YTN activities' because of the dominance of this village type in Paberiwai and

because these three villages were all impacting upon the Wanggameti forest zone, an issue of concern for government and YTN. It was considered important that all of the 'adopting' villages had been following YTN activities for a reasonable length of time.

3.4.3 Data collection techniques used at the village level

a) Introduction to the village level and interviews with key informants

At the village level a method of visiting and revisiting was used, as it was in dealings with YTN staff. In an area where labour was in short supply and food also scarce, frequent but short visits were used between villages and within particular areas of villages so that familiarity could be achieved without burdening any particular farmers. The first visit to each village was for a period of two to three days. During this visit introductions were made to village leaders. Background information about village conditions, experience with the NGO and tree usages was sought from these leaders and other key informants. The research aims and methods were explained and a suitable time for a revisit when farmers could be interviewed with minimal disturbance was agreed upon. This indicated respect for villagers' time and meant that farmers had already been informed of the research from their own people before arrival, thereby assisting familiarity.

Question schedules intended for use when interviewing local leaders and other key informants at this preliminary stage are contained in Appendix A. The actual questions asked varied from these schedules depending upon the interest of the respondent and whether particular questions had become irrelevant because they were obvious from empirical observations or previous interviews. Sometimes different aspects of the schedules were focussed upon for different respondents as the aim was to establish an overall picture of conditions.

b) Return visits to study villages for farmer interviews

After introductions had been made at every study village, each village was returned to on the date promised with village leaders. The purpose of this return visit was to survey farmer households for a two week period in each village. The survey aimed to collect data that would provide insight into the type of participation in YTN's approach and constraints to tree-planting. Information collected related to villagers' way of life, respondents' socio-economic position, other experiences with YTN, experiences with trees and tree-planting in general and farmer thoughts about their own needs and preferences.

The survey was made up of qualitative, semi-structured, probing interviews. A detailed question schedule was created to direct discussion to issues that were believed to be relevant. Most questions were open-ended to promote discussion. Initial questions were broad and narrower follow-up questions were only used if the respondent was being brief when answering. When the respondent revealed tangential issues that were also of interest, these were pursued and questions were spontaneously developed to encourage the respondent to give further insight. Sometimes a particular respondent had far more knowledge about a particular component of the question schedule. In this situation that respondent was encouraged to give further detail.

In selecting households for interview, reliance on formal records to generate random selections would have meant overlooking two poor minorities, some types of slave and female-headed households.[2] Often slaves and wives of polygamous relationships are recorded as being the members of their lord's or husband's households.[3] In reality however, they live in individual dwellings (with their families in the case of slaves and children for the women) and sustain themselves almost independently from the person recorded as being their household head,

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[2] Determined by heredity, there are three general classes of people in Sumba, the *Maramba* (nobles), *Kabihu* (freemen) and *Ata* (slaves). The positions of these classes in Sumbanese society is discussed more fully in Chapter 5, section 5.3.4.

[3] Polygamy is still common in Sumba; the position of women in Sumbanese society is discussed fully in Chapter 5, section 5.3.1.

relying instead on their own labours. Therefore, households for interview were deliberately selected after discussions with the village head or village guides so that groups from all socio-economic backgrounds present in the village could be reached. Interviews were also attempted in all areas of each village so as not to overlook those living in isolated locations. Households following and not following YTN activities were also included. Discussions with all groups ensured that all views on needs were heard when determining the consistency of YTN's programme with farmer needs. Emphasis was also on the identification and interviewing of notable wealthy and influential families. It was possible that they had a greater influence on the overall picture by influencing others' activities as well as just being responsible for their own. Household selection however, was an ongoing process. Assessment of each household's socio-economic condition occurred during each interview. If it was felt that households of a particular type had not been adequately canvassed, then they were sought out by further questioning of local leaders or guides. Alternatively, totally independent selections of households were also made based around rough assessments of observable housing conditions as an indicator of socio-economic group.

The number of households spoken to was less important than the quality of the interview. It was desirable to speak to as many households as possible in the two week period, without compromising interview quality. This meant that 30-40 households were interviewed in each village. It had been planned to conduct interviews in either farmers' garden houses or permanent houses. In each interview it was necessary to carefully determine the respondent's dwelling status. For example, if interviewed in its garden house the location and condition of the permanent house needed to be determined, as did the respondent household's status in that house. Farmers may have miserable garden houses but be the heads of large and impressive permanent houses. Alternatively, sometimes farmers may identify with impressive permanent houses but they may be of slave status; although they attend these houses often they are not their heads and have no control over the house. These farmers usually spend most of their time in the garden house. It was preferred to speak to both household males and females and to talk to households individually without the presence of those external to the household. Although

interviews were planned to occur at farmers' houses, occasional chance meetings with farmers in other locations were sometimes used to talk about particular issues that normally related to the location of the interview.

During interviews an interpreter was present to translate between the national language of Indonesian and Sumbanese (the Mahu version of the Kambera dialect). Some interviews occurred entirely in Indonesian while others were conducted entirely in Sumbanese with the interpreter translating every question and answer. The majority of interviews however, combined the use of Indonesian and Sumbanese, with the interpreter usually clarifying difficult concepts or interpreting for respondents who could understand the question but felt more confident giving their responses in their own language.

In addition to being a major data collection method, semi-structured interviews provided the researcher with an acceptable reason for being in the village and an acceptable activity in the village in the minds of local people. This meant other techniques such as participant observation or casual conversation with respondents could be used without suspicion. Household interviews are familiar to many farmers as a result of past agricultural censuses. During a first meeting farmers may feel more comfortable in the slightly formal setting of a household interview and use of a question schedule than in a seemingly casual discussion. In the latter the researcher goes to some effort to create an atmosphere of spontaneity which suggests that the discussion has not been premeditated. It of course has and this is obvious to most farmers. First time meetings which try to appear informal often attract farmer suspicions. They think the researcher is 'mancing' or fishing; that is, trying to get a response which can be used to incriminate them in some way. After a first semi-formal meeting, future meetings with respondents could be genuinely casual and relaxed.

Two question schedules for these semi-structured interviews were planned, one for farmers in villages engaging in YTN activites and one in those villages which were not. These schedules are contained in Appendix A together with detail as to how the research was

introduced to farmers and some of the modifications made to the schedules over time. Alterations to the schedules were merely to increase consistency with farmer knowledge and to make them more succinct.

c) Return visits to select villages for participant observation and informal discussion

After the first two week period of farmer interviewing in each village was completed selected villages were revisited. The aim was to utilise familiarity with farmers to get information of greater depth. Three weeks were spent in the village of Wanggameti, a village believed representative of other YTN activity villages, to test the truth of statements made in household interviews and investigate some of the outstanding constraints to tree-planting that had emerged. These included forest exploitation, involvement in Forestry Department reforestation projects and the related problem of a lack of labour time. Attention during this visit was also paid to the differing influence independence from agriculture had on following YTN activities. Some of the specific problems of women in Sumbanese society and how these were likely to be influenced by YTN activities were also addressed. Interviews as such were not used in this revisit. Most information was gleaned from participant observation as the researcher followed the cultural and livelihood activities of farmers. Some informal discussions were held with select respondents who had in the previous visit been very knowledgable or open about particular issues.

Upon completion of this time in Wanggameti another quarterly farmers' meeting of YTN was attended in the village of Katikutana. This meeting provided an opportunity to observe the functioning of YTN's meetings (an essential avenue for participation). It also provided a medium towards the end of the data collection period through which the researcher could present some tentative research observations so that they could be received and challenged by YTN staff and farmers. Returning to Katikutana also allowed more casual discussions with farmers with whom the researcher was already familiar.

d) Rapid rural appraisal of conditions in Ramuk

The final data collection task was to travel to the village of Ramuk in the district of Tabundung. This village was outside of the planned study area. However, as the first village that YTN ever entered and as the supposedly most successful village in adopting YTN's activities, it was considered that a case study of the NGO would be incomplete without travel to Ramuk. The visit specifically aimed to examine apparent discrepancies in the comparative situation between this village and other YTN following villages. It had been observed that Ramuk had achieved far greater rates of adoption of YTN technologies although using the standard YTN approach occurring in all locations. The aim was to see if the Ramuk approach was indeed the same as that used in other villages.

Qualitative data were collected via a one week rapid rural appraisal of the village, which relied heavily on empirical observation and discussions with key persons and select farmers. Although time in Ramuk was short and only one visit occurred, previous meetings at YTN functions with Ramuk's YTN staff and some farmers, meant that familiarity with these key persons was considerable. These prior meetings also provided opportunities to publicise the arrival and intentions of the researcher amongst villagers. This substantially improved the chances that data obtained were reliable.

3.4.4 Justification of data collection techniques and approach

a) Ability to facilitate understanding of YTN's operational context

It was stated above that the study did not wish to give inordinate emphasis to the effects of the NGO's structure on participation, nor to participation in influencing the quality of adoption, if this was not really the case. Consequently, a holistic approach to assessment of conditions in the research area was used. This holistic approach was based on systems

principles that any aspect of the agricultural or livelihood system could influence observed outcomes. With this emphasis on holism and the recognition that influential factors could come from any aspect or discipline, semi-structured interviews, participant and empirical observation were considered appropriate data collection techniques as they could obtain qualitative information of the type desired.

Semi-structured interviewing techniques common to participant observation, were flexible enough to allow respondents to lead discussion to issues that they considered important. This type of interviewing thereby adhered to the principles of participatory rural appraisal (Dwaraki and Narayanasamy 1992) by letting local people tell their problems as they wished, with the researcher trying to minimise intervention and merely listen. As the researcher lacked background knowledge of the situation and farmers had an immense understanding, it was only logical that techniques be used which could make use of their greater knowledge, to assess the relative importance of observed phenomena (Bryman 1984: 76). The further advantage of semi-structured interviewing was that the technique's flexibility not only allowed direction by farmers to important issues but also permitted the inclusion of new questions to clarify the material introduced by them and to resolve inconsistencies between matters they raised and what was observable to the researcher.

b) Ability to extract sensitive information with reasonable reliability

These techniques were also validated by the sensitivity of the data desired. In Sumba, farmers were understandably reluctant to confess to practising agricultural and tree maintenance activities discouraged by formal agencies. They were keen to suggest that they strictly adhered to all recommendations made by these bodies. In situations like this, where it is not in the respondent's interest to tell the truth, there may be significant differences between what respondents do and what they say (Bryman 1984: 81). Consequently, there is little point asking farmers directly about these matters, as would be done by formal and structured techniques (Richards, undated). Instead reliable results are more likely using techniques such as

participant observation in particular, and empirical observation in coordination with semi-structured interviewing.

Participant observation enhances reliability by encouraging familiarity and creating a non-intimidatory situation. Familiarity with interviewers clarifies their motivations in the minds of respondents and makes them less threatening, thereby increasing the ease with which genuine information is passed. It also improves the interviewer's knowledge of the backgrounds of respondents individually, and as a group, thereby allowing the interviewer to better assess whether it is likely that truthful responses are being received. Awareness of the physical conditions in which respondents reside, resulting from participant observation, also allows some verification of the statements made by them. Similar advantages could be obtained by conducting semi-structured interviews while empirically observing the fields of respondents, as the truth of respondents' statements were bound by the observable reality.

The use of data collection techniques that emphasised the establishment of rapport was also necessary because of the inherent suspicions of the Sumbanese towards strangers. Fear of strangers is said to originate from the existence of a rapacious slave trade and headhunting practices throughout the island, in the eighteenth, nineteenth and early twentieth centuries (Needham 1980: 21, Kuipers 1990: 17). Despite decades of pacification a suspicious and insular nature continues to be observed by both other ethnic groups in NTT and foreigners alike (see for example Forth 1981: 22)

c) Importance of time to the establishment of rapport

The creation of familiarity between researcher and respondent, emphasised above as a crucial prerequisite to the attainment of reliable information of a sensitive nature, could only be achieved through residence in the village environment for significant lengths of time. Jorgensen (1989: 57) says that time is an ally: the longer or more frequently that one is in a setting, the more people perceive one as non-threatening and take one's presence for granted. This

increases trust and facilitates information transfer. Establishing familiarity did not necessitate 'knowing' every farmer but it was important to 'be known' in at least the study villages. Through intimacy with a few farmers, word of the researcher spread to those not yet met. This assisted the rate of establishing familiarity when a first meeting did occur.

Due to the importance of time to the research goals, Rapid Rural Appraisal (RRA) was used sparingly. For those involved in both rural development research and practice it has become popular to rely on RRA. In this study however, RRA was used only to get very general background information when consulting key persons, and during the visit to Ramuk when some familiarity had been established before the visit occurred. Although the study's holistic and multidisciplinary approach and its emphasis on semi-structured interviewing and empirical observation techniques are characteristic of RRA, they are also characteristic of a general approach to research that emphasises the collection of qualitative data. Data collection had one crucial difference from RRA in that it was not rapid.

Indeed there is some inconsistency between RRA's emphasis on qualitative assessments of rural conditions and use of informal techniques, and its advocacy of a 'rapid' approach to data collection. Meaningful qualitative knowledge can only be acquired, and the reliability of information obtained through informal, abbreviated means can only be guaranteed, through the establishment of trust. This takes time, otherwise results are distorted by the likelihood that the few responses proffered have been designed more to appease the researcher, than to inform. The time taken to develop this trust may make the data collection process longer than if entirely formal and structured collection techniques were used. It has been common to criticise users of RRA for bringing disrepute to the approach because of a hastening of the process motivated by political or financial factors (Carruthers and Chambers 1981: 418, Swift 1981: 485). However, it is the inherent contradiction between the techniques advocated and the time scale recommended which contributes to misuse. Flawed results are perhaps an unavoidable result of this disparity. If RRA relied entirely on empirical observation for data collection then it would be able to ensure some accuracy. By recommending however, the

collection of qualitative data from key respondents so that researchers can see problems from their perspective, more time is needed than RRA permits. Therefore, RRA should perhaps be centred around the use of empirical observations. Techniques designed to assist researchers in understanding the perspectives of respondents should be restricted to modes of analysis which emphasise the establishment of rapport rather than the use of rapidity, that is, Rapport Based Rural Appraisals.

d) Consistency of multi-disciplinary approaches with research conducted by individuals

There was considered to be no contradiction in an individual researcher using a multi-disciplinary approach. The multi-disciplinary approach of RRA often advocates the use of multi-disciplinary teams so that limited opportunities for empirical observations can provide maximum insights (Hildebrand 1981: 425). However, the use of multi-disciplinary teams in some RRAs does not mean that this is the only way in which multi-disciplinary approaches can be conducted. A multi-disciplinary approach is related to the nature of analysis rather than the background and make-up of the individual(s) responsible for conducting the research.

Supporting this contention, is that the use of multi-disciplinary teams in the conduct of RRA is optional. For example, Carruthers and Chambers (1981: 418) suggest that RRA uses a multi-disciplinary approach. However, they list the use of multi-disciplinary teams as merely one of the optional techniques available to RRA, thereby implying that multi-disciplinary RRA can occur in the absence of these teams. This is illustrated by Ellman (1981: 466) who performed a multi-disciplinary RRA as an individual.

Furthermore, if multi-disciplinary approaches cannot be used by individual researchers, then how many members are necessary to constitute a team suited to the conduct of this type of research? Collinson (1981: 440) describes an RRA which involved the pairing of an economist with a biologist. What happens however, if the important elements of the system being analysed emerge from the culture of the studied population, or from their historical

experience? Perhaps the addition of an anthropologist or historian would overcome this problem. The constituent elements of a system however, cannot be foreseen and could relate to any disciplines. If it is argued that individuals from different disciplines are required to obtain multi-disciplinary analyses, then the teams to be constructed for these purposes will be enormous as they will have to cover all of the disciplines that could possibly be relevant. This is clearly impractical. It illustrates that the multi-disciplinarity of an approach is not related to the varying disciplines of those individuals conducting the study.

Therefore, multi-disciplinary analysis is found in the attitude of a researching individual, rather than in an ability to expertly identify and analyse every aspect of every discipline that could be relevant. It is the possession of an openness which recognises that influential factors can emerge from any element of a system. In this study it was characterised by an adherence to the likelihood that factors influential upon adoption of tree-planting and participation could come from any discipline and not be confined to economics, the existing agroecosystem or method of production, socio-cultural or any other factors. It is acknowledged however, that in the absence of expert knowledge of all possibly influential disciplines, their recognition could only be achieved by spending more time in the field. More time allowed the incorporation of farmer participation in the research process so that the farmers could direct the researcher to the most relevant aspects of the system, and assist in comprehension of them, in accordance with their expert local knowledge. This notion that individual multi-disciplinary analyses can take longer than those undertaken by teams is shown in Ellman's (1981) individual analysis which was made possible by extending the period of his appraisal to six weeks.

e) Examining a causal relationship via the use of qualitative methodologies

The second specific aim of the research was to examine the relationship between the approach used by YTN and the type of adoption of tree-planting systems achieved under that approach. This aim emphasised ascertaining what was actually responsible for the observed quality of adoption. In particular, a comparison between the strength of participation instituted

by the organisation and the quality of adoption, was to be made. This aim could be interpreted therefore, to be demanding analysis of a causal relationship. It was being observed whether the existence of participation had a causal effect on the quality of adoption. The analysis of an apparently causal relationship requires explanation because of the methodology's qualitative nature. The analysis of straightforward, linear, causal relationships, such as, "if there is '*x*' amount of participation then there will be '*y*' type of adoption", has traditionally been considered best dealt with by quantitative techniques. This is because these techniques were perceived to be more controlled, deductive and oriented towards verification than ones of a qualitative nature (Reichardt and Cook 1979: 11, 17).

Nevertheless, preference towards quantitative techniques in the verification of linear causal relationships does not necessarily mean that the use of qualitative methodologies is misplaced in the analysis of the particular relationship examined in this study. Even if the relationship examined here was of a linear nature, it has been argued that qualitative techniques can still be used to analyse causal relationships of this type. They can describe these relationships and discover theory (Filstead 1979: 42). Their only limitation is that they cannot scientifically verify either descriptions made of a relationship or theories generated about it.

However, this purported inability to verify is compensated for by other functions performed by qualitative methodologies. These functions are possibly more valuable than an ability to apply scientific verification if one accepts that causal relationships, including the one observed in this study, are in reality neither one-dimensional nor linear. This view is supported by Manicas (1989: 187) who says that no relationships between two functions can follow a linear path of causality, every event is the result of "...multiple causes operating in the world". Consequently, these relationships can be better understood by qualitative methods which take into account the entire system in a manner that is difficult for controlled quantitative studies to emulate. The research's second specific aim frames examination of the relationship to be observed in neither a one-dimensional nor linear mode. It is expected that other factors could be at play and thus, importance is given to developing an understanding of the entire system. The

aim does not merely ask what is the effect of participation on quality of adoption, but goes back a step further and asks what it is that is responsible for the quality of adoption observable. Therefore, the real situation is examined first and not just participation's role in isolation. If participation can be seen to be influential then it will be decided exactly what sort of role it is having. However, this will not occur before this decision has been made and not before dismissing, or examining and finding to be important, other influential factors. Such a framework is consistent with Patton's (1980: 278) major principle of qualitative analysis which stresses that, "...causal relationships and theoretical statements [must] be clearly emergent from and grounded in the phenomena studied. The theory emerges from the data; it is not imposed on the data."

Therefore, qualitative techniques when used in the context of an approach that accounts for and assesses the entire system in which events and outcomes are couched can make useful observations about causation. The warning is merely that, as useful and important as the observations, processes and relationships derived from a qualitative methodology are, they cannot be regarded as truth and they must remain at the level of hypothesis (Patton 1980: 324, 327). However, even this is now a matter of debate. It has been argued that the observations of qualitative analyses are verifiable, even though their verification cannot be based wholly on scientific principles. It is suggested that perspectives obtained from qualitative methods can be verified and validated by looking for counter-examples and alternative explanations, and by relying on reason, evidence and argument, in what has been described as a 'quasi-judicial' process modelled on the problem-solving principles of jurisprudence (as developed by Bromley and cited in Robson 1994: 375-376).

3.5 Problems executing the planned methodology

3.5.1 Administrative problems

There were considerable administrative problems in doing research in Indonesia. An initial problem was the difficulty of getting the necessary research visa from the Indonesian Institute for Science (*Lembaga Ilmu Pengetahuan Indonesia*, LIPI) which took 12 months and required the payment of various charges. A major problem was then experienced when reporting the intention to do research. As is evident from the fieldwork itinerary contained in Appendix B, this process took 21 days. The delay was due to the obstructiveness of the Immigration Department in Kupang and the short opening hours of most offices which meant few could be visited in the one day.

These dealings with the Indonesian bureaucracy were invaluable in understanding the problems small farmers have when trying to cope with the same bureaucracy while certifying land, trying to argue forest zone boundaries or carrying out other tasks. If one has little time or cannot afford transportation costs to get to offices and accommodation costs in order to stay near them while processing documents, if one has no power base or support from a particular institution and if one cannot afford to fulfil the burdens of any informal agreement reached with staff to get the relevant matter heard, then one has no hope of successfully dealing with these agencies. As part of the preparation for fieldwork the tribulations of Siro Mallik (Madiath 1989) were read. The value of the article was believed to be in outlining the problems small farmers have when dealing with bureaucracy but in hindsight it was a poignant methodological text. Siro's trials when applying for his cart and pair of bullocks are relevant not only to small farmers but to foreigners trying to obtain a research permit and a pair of 'KIM/S' (that is, the original entry card and its extension).

3.5.2 Problems extracting information from offices of the regional government

As stated, it was difficult to collect data from government agencies at the regional level because of the lack of exposure of most staff to the isolated district of Paberiwai. It was especially problematic that most *Kepala Dinas* (Departmental Heads) had never travelled to the study villages. As shown in Table 3.3, the lack of knowledge of the interior by those *Kepala Dinas* consulted, was also due to the short time they had been incumbent in East Sumba and their having originated from places outside of the region.

Table 3.3: Origins and lengths of tenure of regional agency heads consulted in East Sumba

Position and Department	Place of Origin	Time in East Sumba to date
Head of Statistics Office	West Sumba	1.5 months
Head of Social Dept.	Flores	6 months
Head of Agricultural Dept.	West Sumba	1 year
Head of BANGDES	Flores	1.5 years
Head of Forestry Dept.	Flores	2 years
Head of Agricultual Extension Division*	Java	7 years

* Although the Head of the Agriculture Department's extension agency had been in Sumba for seven years, he had never been to the Paberiwai district in this time. He returned permanently to his place of origin while government officials were being interviewed.

The shortcomings of *Kepala Dinas* could not easily be overcome by approaching their staff. *Kepala Dinas* deliberately monopolise communication with outsiders, perhaps because they are responsible for their respective department's image. This problem with *Kepala Dinas* can be equally applied to other staff who also tend to come from outside East Sumba, and who abandon it as soon as improvements in their qualifications and experience allow them to move to more central locations, preferably near their places of origin. Many regional officials consider being sent to the regional capital of Waingapu a burden in itself. To then travel to distant Kecamatan locations is an unreasonable hardship.

Significant problems were experienced when seeking secondary data at the regency level. Of most concern were problems related to data contained in the *Potensi Desa* (Village

Potentials) Reports available from the Village Development Office (BANGDES). These reports supposedly contain detailed annual data from each village. Unfortunately, the *Potensi Desa* Reports for Paberiwai's villages were incomplete and often contained inconsistencies. BANGDES staff attribute this to poor collection methods. The reports are completed by staff of the village government who collect the data with no training, no supervision and who often have no concept of what they are supposed to be recording or of the measurements to be used. Furthermore, village government staff have no funding to collect these data nor to perform their other functions. Their positions are essentially voluntary, and this erodes their enthusiasm to collect *Potensi Desa* data competently. As a result of inadequacies in the *Potensi Desa* reports they could only be trusted in relation to certain information that was easily understood and measured and relatively unchanging from year to year. Other than that they were taken to be representations of the estimates and thoughts of village government staff rather than objective data.

A recently completed Poverty Map, which indicated all of the impoverished villages in NTT (being completed for all of Indonesia), would have been useful to assist in the task of village selection. At the time of data collection however, officials in NTT would not release the map because it was under dispute. In Sumba, and no doubt elsewhere also, it offended many officials at the regency level and thus they were in the process of challenging its variables.

3.5.3 Problems experienced when interviewing farmer households

a) Finding suitable locations for interviewing farmers

Many problems were experienced when interviewing farmer households. Initially it was difficult to know what was the most convenient location and time for interviewing farmers. Through trial and error it was decided that the best method was merely to show up at farmers' houses, make introductions (hopefully eased by others telling the householders about the

researchers or them previously seeing the researchers) and then engage in discussion. The disadvantage with this method was that often farmers were not home because they had no notice of the interviewers' arrival. Farmers were often working in their fields when the interviewers arrived. It was considered too great a disturbance to call farmers from these fields for the purpose of the interview. To request this would have demanded farmers travel a large distance to get to the household and then back to their gardens at the interview's completion.

Interviewing farmers in their fields was difficult because they often work in groups. These groups vary in size depending on the task done, from five to fifteen people for weeding or clearing to fifty people for harvesting. It was thus impossible to interview individual households in the fields because the whole work group would stop and participate in the interview. This meant that individual experiences and thoughts were distorted by peer group pressure with responses being designed not to offend others present, or to avoid others from using what was said to later incriminate the respondent. Alternatively, the most influential individual in the work group would impose his or her thoughts and experiences on the others which made it difficult to access the opinions of group members from powerless backgrounds.

It was also considered inappropriate to make times for farmers to wait in their houses for the research team's arrival. Farmers and the researcher were suspicious of this suggestion because the Sumbanese do not have a culture of committing themselves to appointments and pay little attention to the twenty-four hour clock. Furthermore, the interviewer could not faithfully fulfil any promises of appointments because the length of any one interview with a household was uncertain and dependent upon its goodwill and reception. Thus it was impossible to know when one interview would finish and at what time another could begin. Moreover, it was experienced that when farmers knew the researcher was coming to their area they gathered at the house of one renowned villager. They said that they did this to save the interviewer the time it would take to travel between houses but another purpose was no doubt that they felt more secure grouping together in this manner.

Many members of village government recommended that household heads be called together at the house of either the RK or RT head (village government officials). This suggestion emerged merely because meetings of this type are the norm for village government. They were however, considered inappropriate because they would have involved grouping people together and thus had the same disadvantages as meeting work groups in the fields. The confident and influential would have dominated these meetings while the powerless and women would have been under-represented. While it was imagined that few would have responded many would have been requested to attend and this would have meant many would waste their time. Additionally the research method relied upon some assessment of the physical condition of the respondent's house. This could not be done at group meetings isolated from the respondent's home and fields.

Visiting houses in the late afternoon or at night meant that it was more likely the researchers could meet farmers at home. Unfortunately because Sumbanese upland farmers live distant from one another and their houses are often joined only by narrow, rocky foot tracks bordered by cliffs or vegetation, it was difficult to travel between houses at night. Furthermore, it appeared that the traditionally suspicious Sumbanese were less comfortable receiving guests, whom they had never met before, at night. Throughout the period of household interviews only one household was uncooperative and refused to participate in the research. This household's interview occurred at night where the interviewers were dehumanised by darkness, appearing as strange shadowy images. It was felt after this experience that initial meetings should occur during the daytime when the interviewers could illustrate their caring and attentiveness in their facial expressions.

Even when interviews were conducted in the preferred environment of farmers own houses groups still sometimes formed. It is an Indonesian norm to gather at the house at which guests arrive and this carries through to the traditional communities of Sumba. Fortunately the problem did not arise often because of Sumba's relatively low population densities and the small, isolated nature of its arable land. This means its houses are some distance from one

another and makes grouping more difficult. When small groups did form at farmer households, sometimes in the middle of an interview which commenced individually, it was obvious that some farmers tended to give the same response and agree with a particular, influential member of the group rather than thinking about their own situation. This was particularly evident in relation to subjective questions about felt needs and difficulties experienced. It was also apparent that males were most likely to group at a house at which a guest was in attendance and that when this large number of males arrived at a house it became more difficult to talk to women of the respondent household. If groups formed during a household interview it was openly expressed to the group that the interviewers wanted to give this household the opportunity to describe its experiences and that other households would have their opportunity at a later date, we thus requested that everybody else refrain from expressing their opinions at this stage. If the interview situation was still far from optimal the respondent was encouraged to show the interviewers around their housegardens or nearby fields so that the discussion could continue informally away from the group.

b) Interviewing females

In all household interviews it was difficult to encourage the participation of household women. This was contributed to by Sumbanese culture which dictates that household males, if present, must receive and speak with guests. Many Sumbanese men expressed the view that, 'If the wife does the talking and receives the guests then who stands behind her?'. They imply that if the wife is talking then the husband must be in the background behind her and this is embarrassing and shameful. It is a matter of pride that the dominant role in conversing with guests be taken by the male. The Sumbanese are acutely aware of the back and the front but appear to have no concept of the side. Sumbanese culture also demands that guests be provided with coffee and food and this provides an opportunity for women to be removed from the front of the house to the kitchen at the back. During interviews women tended to remain towards the back of the house even after refreshment preparation was completed, within listening distance but far away enough to avoid participation.

To approach household women a female research assistant from the interviewing team accompanied the women to the kitchen during food preparation and tried to engage in very informal casual discussion. This had some success but was still constrained by many women being less conversant in the national language, Bahasa Indonesia. This results from their relative lack of formal education in comparison to males. The most successful means of accessing the viewpoints of women was by residing in the one village for a length of time, establishing familiarity with the women and for the female research assistant to engage in casual discussion while participating in everyday activities, such as fuelwood collection, cooking and nursing.

Actual interviews of women had more success during the dry season. During the dry season when there is a lull in agricultural activity household males engage in a range of leisure activities away from the house. These include the hunting of wild boar or collection of tree products in the forest, travel to market, requesting food from family in neighbouring villages or attending cultural activities. Women are often left to guard the houses and children while slowly clearing the fields around the house in preparation for the upcoming planting season. Many women were quite talkative when alone in the house perhaps because they did not have to worry about dominating or appearing more knowledgeable than their husbands. There was some resistance by local guides who considered it pointless to visit houses from which the household 'head' was absent but these houses were entered anyway because of the excellent opportunity they provided to talk to women.

c) Overcoming farmer suspicions and sensitivity

Another significant problem when conducting household interviews was the tendency of farmers to be suspicious of the interviewers' motives for coming to their village and consequently not speaking their true thoughts and experiences. Although occurring in all locations, this problem was particularly severe in Katikutana where the entire village was under threat of being resettled from the mountains. Despite the lengthy introductions given by the interviewers, farmers were still not convinced and preferred to categorise the interviewers with

strangers who had come before. In Katikutana in particular, farmers were determined to think the interviewers had strong ties with the regional government and had come to identify who was lazy and who was hardworking so that those to be resettled could be identified. It was problematic if farmers held this erroneous belief because everything they said was designed to appease somebody from the regional government rather than reflecting their own thoughts and experiences. This problem could only be overcome by making very blunt introductions (as contained in Appendix A), establishing familiarity and creating an image which was as different as possible from their stereotyped perceptions of regional officials. This meant empathising with, accepting and being highly interested in the conditions of even the smallest farmers, adopting a non-intimidatory attitude (as outlined in Watson *et al* 1989), travelling by foot and spending much time in the mountains rather than rushing to return to the regional capital.

It was also common however, for farmers to want to believe that the interviewers were staff of YTN or at least strongly sympathetic admirers of the organisation. This again was despite efforts to introduce the research as being an objective assessment of YTN. Farmers holding these suspicions tended to recite lessons they had received from YTN extensionists rather than describe what they had experienced themselves. With regard to the maintenance of tree legumes for example, farmers would recite the theoretical best maintenance strategy that they had heard from YTN rather than saying what technique they actually used. They were also careful not to say anything that would contradict the information given to them by YTN extensionists. Interestingly, farmers responding in this manner tended to be those who knew less about YTN and followed its activities with less rigour. They knew YTN was not a government agency but that it was a formal organisation. This air of formality meant that they treated it in the same manner as government agencies (the only other formal agencies with which they were familiar) which involved giving it their unwavering public support. Farmers deeply involved in YTN knew more about the organisation and knew that it encouraged farmers to participate in their own development to the extent that farmers were invited to choose new directions for the organisation and suggest better techniques and methods. These farmers

tended to speak openly and candidly about all matters including problems and successes that they had experienced with YTN and its activities.

To overcome the problem of farmers not wanting to speak openly about their experiences with YTN it was necessary to corner these farmers with the reality of their own situation. If it appeared that farmers were perhaps reciting lessons received rather than personal experiences the interview was relocated to their nearby fields. This meant respondents had to be more genuine about the techniques used and the reasons for this because the condition of their crops and fields was apparent. A similar technique was used when asking farmers why they still preferred to farm cleared scrubland in the forest zone using traditional techniques. If farmers were asked this at their permanent dwellings in relocation zones by the major road they simply denied that they had gardens in the forest zone. However, if the same farmers were asked the question at their forest zone gardens they were compelled to give some explanation. There was no noticeable ill-feeling from farmers when they were interviewed at locations which they preferred not to reveal to outsiders. Once at these locations and the farmers could see that the interviewers were not angry at them for failing to do things that formal organisations recommended, there was a sense of relief amongst farmers. They then found the interviews a good opportunity to express reasons why they continued to do things which formal agencies told them they should not, such as using fire in the preparation of their fields, cutting gardens from the forest and neglecting some of the modern techniques from YTN. Farmers tell innumerable stories of how those from formal agencies become angry with them if they are discovered by these officials engaging in formally prohibited activities. When interviewing farmers at their homes many were understandably closed about their activities as they still suspected the interviewers were from formal agencies. However, when the interviewers were observed to remain friendly and oblivious to any 'wrong doing' at garden sites, it instilled confidence in respondents and reassured them that they were not undergoing inspection.

Compelling farmers to answer truthfully with what was observable in their own fields was considered consistent with objective research. It was not felt that this unduly distorted

farmer responses. Farmer responses were distorted, but only towards reality, not to something that the interviewers wanted (distorted to explain what was observable rather than distorted to test the interviewer's theories). For example, one farmer when asked what he thought of the Red Calliandra tree legume (*Calliandra calothyrsus*) as a terrace tree for intercropping initially said that it was a fantastic tree because it increased fertility from year to year making his field progressively more productive. His field was easily observable from the interview site and it was apparent that he had neither pruned nor intercropped tree legume rows for at least the last two years and indeed had opened a traditional garden with no legume rows. This observation and the farmer's response prompted the interviewer to ask if Red Calliandra increased fertility annually why was he not using his legume field but had opened a traditional field nearby. This particular farmer then said that in fact he had noticed some disadvantages with Red Calliandra because its roots competed with food crops. By relating his initial response to what was observable a more complete and truthful response was received. However, other farmers in this situation said that the Red Calliandra field was suitable for food crops and progressively fertile but they planned to turn it over to tree crops using the Calliandra as a shade tree. In this circumstance, in the absence of observable evidence to the contrary, the interviewers accepted the response.

When interviewing farmers the interviewers started from a handicapped position. Farmer responses were already skewed by their preconceptions of the interviewers; by bad memories they had of being interviewed in the past (which were normally inspections by officials who became angry if farmers told them what they did not want to hear); and by the vast number of matters they wanted to conceal because they either involved disregard for official directives, suggested the farmers were ignorant, were culturally private matters or were sensitive for some other reason. To eliminate from the survey those farmers whose responses were suspected of being untruthful would also have distorted the results because the majority of farmers had something about which they were shy. Instead the interviewers had to be sensitive and give consideration to the reasons why farmers responded as they did. This involved looking at their backgrounds, any official duties they had to perform and what

pressures were acting upon them. It was in these circumstances that the interviewers considered it fair to confront respondents with the reality of the conditions around them. Empirical observation and farmer interviews were not carried out as separate activities in this sense. By encouraging farmers to make empirical observations together with the interviewers what was observed could be fully explained and what was said could be tested against reality.

d) Circumnavigating gatekeepers

A further problem was the propensity of some village leaders to control which farmers and locations were visited by the interviewers. This problem was particularly severe during a short visit to Ramuk in Kecamatan Tabundung. Ramuk's leaders tried to limit the interviewers so that only those areas near the village's central complex were visited. The interviewers were not encouraged to visit areas distant from the complex especially those areas in the forest zone. The village elite said things like: these areas were too far away; the interviewers did not have enough time to get there; there were almost no people there, and that those who did live there did not have anything interesting to say anyway. Attempts were also made to hinder interviewer visits to these areas by having guides not turn up on the days visits were planned (although there were always plenty of locals available for visits around the village complex). This non-cooperation was related again to suspicions as to the interviewers' motives. Ramuk's leaders were justifiably concerned about their village's image as it had only avoided relocation by creating the impression that residents no longer farmed in the forest zone and that all had embraced YTN's technologies. To achieve this they had intensified the use of YTN technologies in areas frequently visited by officials around the main road and in the village complex. This plan had been remarkably successful, assisted by most visitors usually only staying for short periods from two to four days which meant there was plenty to occupy them in and around the complex. It was also helped by the reluctance of many visitors to travel to forest zones as they were distant and no vehicular access was possible. Ramuk's leaders perhaps interpreted the interviewers' relationships with YTN and formal government agencies (in reality only a theoretical interest in YTN and at most sponsorship from a couple of formal agencies) as

meaning that they would have some influence on Ramuk's image with those who determined villages to be relocated and indeed villages to receive prizes (Ramuk targetted prizes for village development as a source of village revenue). This preconception was perhaps responsible for attempts village leaders made to restrict the interviewers to those areas intended to be shown to visitors and away from locations likely to damage their image.

A similar situation occurred in the community of Pahulubandil in Wanggameti village. It had been planned to visit farmers at their garden houses which happened to be in the forest zone. The hierarchy of Pahulubandil were understandably nervous about this and tried to discourage the interviewers from visiting that area. They suggested that it was a severe climb back to the Pahulubandil complex so it would be better for all farmers to be called up to the complex. The interviewers reiterated reasons as to why it was preferred to visit farmers in their homes and gardens but the leaders of Pahulubandil were insistent.

In Pahulubandil and Ramuk the only alternative was to visit these areas anyway regardless of whether the visit was sanctioned by local leaders and whether guides were available or not. The leaders would not physically restrain the interviewers. The only risk was that they would be offended by the interviewers' insolence. However, this did not eventuate. As the interviewers set off for farmers' garden houses at Pahulubandil, local leaders quickly selected a guide to follow and there was never any ill-feeling from that time on. In Ramuk the interviewers travelled alone for four hours through the forest zone until they reached a number of locations where gardens were being cut. No guide was provided but navigation was possible from advice given by the occasional farmer met on the track. Upon returning to the village complex the village elite were shocked at hearing where the interviewers had been. However, once more, travel to these areas did not strain the relationship between interviewers and leaders but indeed made it more comfortable. Having visited these gardens the leaders no longer had anything to be secretive about. They seemed relieved and able to speak more openly. Some leaders even found it humorous that they had tried to prevent the interviewers from visiting their forest gardens but they had travelled there anyway.

e) Differing expectations

A final difficulty of household interviews was farmers' inexperience speaking to strangers, especially those who they perceived as coming for a formal purpose. Many farmers expected the interviewers to give extension. They found it difficult to understand that the interviewers wanted to come and learn from their experiences and hear their thoughts about particular issues. This was a result of most people from formal agencies spending more time telling them what to do, rather than asking them about what they do at present and would like to do in the future. Some farmers even thought that the interviewers must have been incredibly ignorant and could not have come from a University if they depended upon ordinary farmers to learn. One farmer, when asked the spacings he planted his corn and the number of seeds he placed in each hole, in order to determine the area of his field, replied that if the interviewers were really from a University why did they not know this already? In these circumstances the purpose of the research was carefully reiterated. Farmers were given more confidence in speaking about their activities and experiences after revision of the question schedule so that questions relating to size, number and type came before more conceptually complicated questions relating to difficulties, needs and opinions of certain activities.

3.5.4 Problems related to research assistants

a) Selection of research assistants

An initial difficulty was the selection of research assistants. It had been planned to select assistants with tertiary education. Although the major role of assistants was to interpret between the Sumbanese and Indonesian languages it was hoped that University graduates would better adapt to the research method. Unfortunately, after a lengthy period of notification no graduates were available from an East Sumbanese background. Casual remarks by academics at the Nusa Cendana University suggest that there is a relatively small number of

students from East Sumba and that this is due to their smaller population and traditionally insular outlook. A cross-section of the ethnic groups which fill NTT education institutions is provided by looking at the 1993 graduating class from Kupang's renowned Agricultural Polytechnic. Of the Polytechnic's 118 graduates none originated from East Sumba, the only major ethnic group from Nusa Tenggara Timur not to be represented, together with Savu (*Pos Kupang* 1993, 12). Flores was best represented with fifty-five graduates, West Timor had forty, West Sumba nine and all of the other major NTT islands were represented, such as Alor and Rote. Indeed eleven graduates came from as far away as Maluku, Sumbawa, Sumatra and Java. The dominance of Flores, Timor and groups from other provinces and the absence of East Sumbanese reflected above are consistent with the subjective opinions of academics. Consequently, assistants with secondary education were obtained from the Kecamatan capital of Kananggar.

b) Interpreters' difficulty with the desired research method

Interpreters had difficulty adapting to the research method. This included giving leading rather than open-ended questions. Sometimes they also elaborated on respondents' answers by drawing on their own experience. This tended to invalidate information given by respondents and discouraged them from speaking when presented with other questions, as they knew the interpreter would help them in appeasing the interviewer. They also sometimes felt intimidated by the interpreter's knowledge. Respondents felt that there was no point hearing from them because the interpreter was far more knowledgable. The interviewers followed the principles of appearing ignorant of the farmer's situation (which was genuine) and very rarely espousing what had been learnt while in Sumba. This made respondents feel confident that the interviewers wished to learn from them and were interested in what they had to say. This was even if it meant respondents believed the interviewers to be stupid.[4] Farmers were far more confident and comfortable speaking with the ignorant than with the very knowledgable.

[4] In that manner being consistent with Edwards (1989: 122) who says that researchers must adopt humility as part of their attitude when trying to learn from the poor so that they will be confident to speak.

These tendencies to give leading questions and elaborate for respondents were quickly redressed by carefully monitoring interpreters' actions and reiterating the desired research methods in frequent discussions away from farmers. Interpreters were also frequently asked their own opinion about particular issues, again away from respondents, so that they would have the opportunity to express their knowledge. It was hoped that with this chance of expression they would restrain themselves during interviews.

c) Disadvantages of using one interpreter for long periods

Fatigue and boredom were contributing factors to the problem mentioned above. To avoid this interpreters were rotated more often so that each interpreter would only work for two weeks at a time. Contributing to this decision were other perceived disadvantages of having one interpreter accompany the interviewers continually. One of these was that permanent accompaniment reduced opportunities for the interviewers to build up relationships with farmers (essential for familiarity) because the interpreter insulated the interviewers from farmers. Interpreters came to know the interviewers intimately, their backgrounds and stories. At a first meeting, farmers were often curious about the interviewers and asked questions about them. Due to an interpreter's presence they directed their questions at him. As they asked in the Sumbanese language the interviewers were unaware of what they were asking. The interpreter could answer the farmers' questions without referring to the researchers because of his intimate knowledge. This was considered an opportunity lost for informal communication between the respondents and interviewers that would assist familiarity. When interpreters knew less of the interviewers they were compelled to relay even the simplest of farmer questions to the interviewers. This strengthened the relationship between farmer and researcher, thereby making questions during the interview easier and less strange.

d) Unsuitability of assistants working independently

The likelihood of minimally trained assistants collecting data inaccurately due to lack of concern, motivation and supervision has been widely observed (Moore 1979: 4, Ellman 1981: 464, Delforce and Potter 1991: 9). Due to these findings, together with the researcher's own experience suggesting that the reliability of data collected by unsupervised assistants would be extremely doubtful, it was decided that it would be better to concentrate resources on collecting information in villages in which the researcher was present.

CHAPTER 4

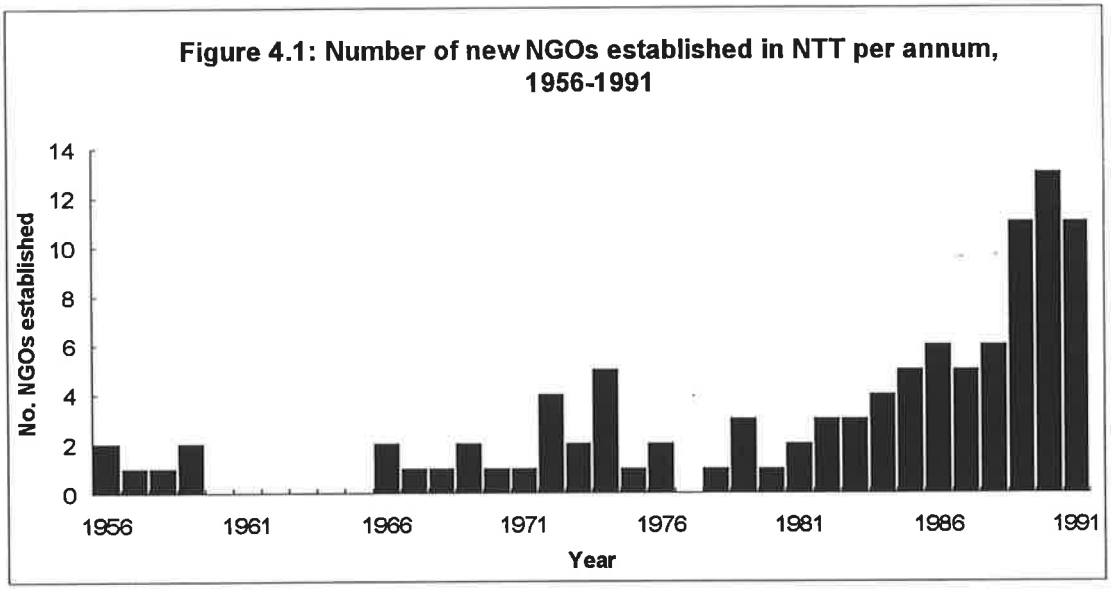
BACKGROUND: NGOS, YTN AND THE STUDY AREA

4.1 Background of NGOs in NTT

4.1.1 Characteristics of NTT's NGO community

NTT's NGO community is characterised by a large number of separate agencies. As stated there were 101 at the end of 1991. As shown in Figure 4.1, most of these NGOs are still new. More than half of those currently operative were established after 1985 and almost three quarters came into existence during an "NGO boom" which commenced at the beginning of the 1980s.

Figure 4.1: Number of new NGOs established in NTT per annum, 1956-1991



Source: WALHI 1991, BKKKS and OXFAM 1992

In terms of activities conducted, most NGOs have focussed on service provision through supposedly participatory small projects. Table 4.1 indicates that there is a large variety of services provided by these NGOs. Despite this variety there is much similarity between their

overall programmes. Most agencies provide a similar mixture of services usually relating to all aspects of a community's livelihood, from agriculture and livestock to health and marketing. Despite the growing international popularity of NGOs engaging in representation and advocacy of the poor, just four agencies in NTT say that they perform this function (most of which is legal rather than social or political).

Table 4.1: Activities conducted by NGOs in NTT and absolute number involved in each activity

Activity	Number of NGOs involved in each activity*
Agricultural improvement	61
General education of and extension to local people	52
Livestock programmes	51
Community health	43
Group cooperation and joint production (home industries)	41
Drinking water and irrigation programmes	34
Specialised education and training courses for select groups	27
Fisheries	25
Environmental conservation	24
Forestry, regreening and agroforestry	20
Credit, finance and marketing assistance	20
Children's welfare	16
Assistance for the disabled	11
Appropriate technology identification	11
Subsidised housing	8
Community organisation	7
Family planning	7
Research	7
Legal and political representation	**4**
Assistance with transmigration projects	3
Coordinates other NGOs	2
Creation of development media	2
Fund infrastructure provision (roads, housing)	2
Tourism	2
Women's Issues (specialise)	1

* From a total of 101 NGOs operative in NTT.

Source: WALHI 1991, BKKKS and OXFAM 1992

Many of NTT's NGOs operate on only a very small scale. Their activities are often restricted to just the one district (Kecamatan) or perhaps to a few villages or even an individual village. In

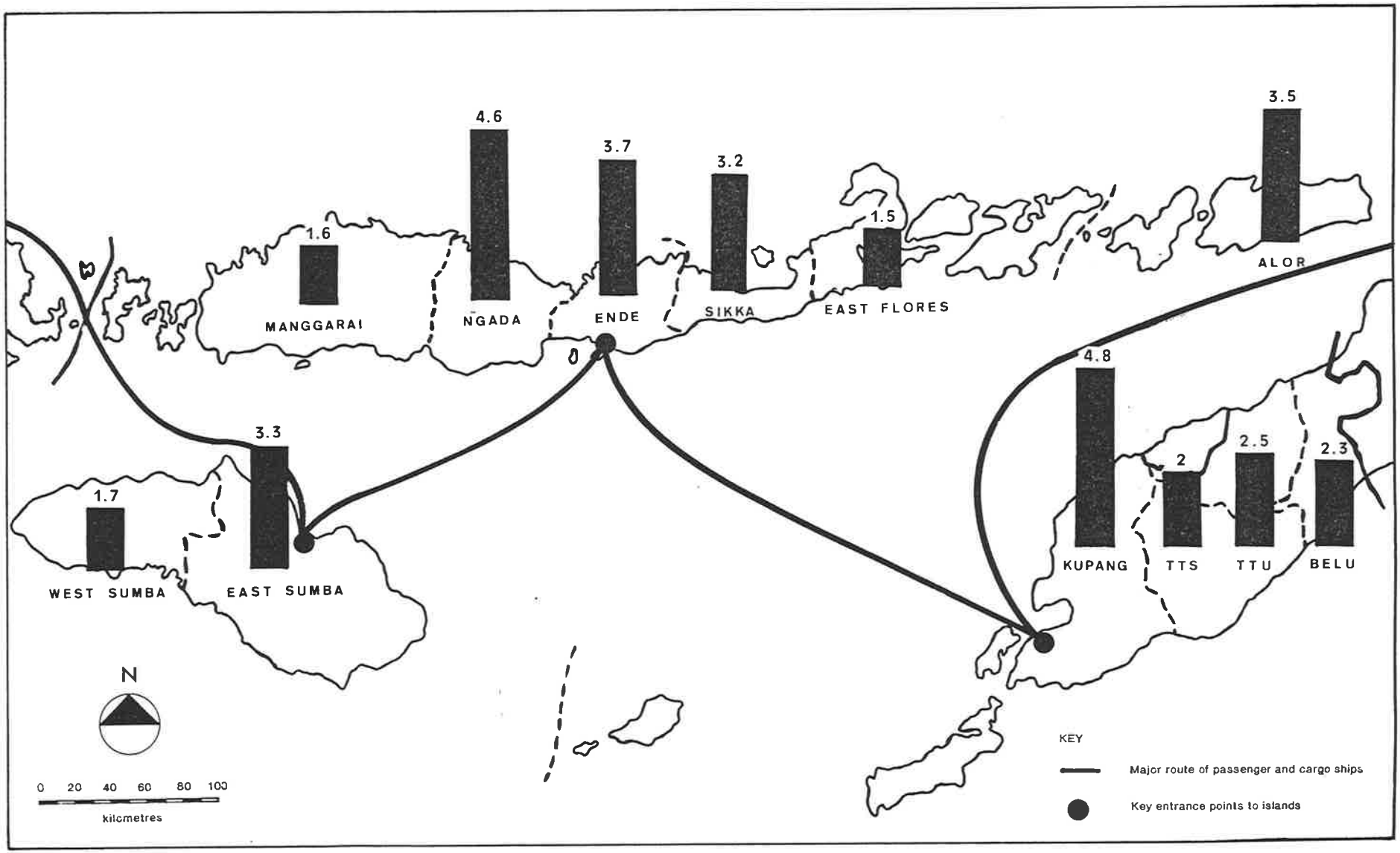
terms of location, these small-scale NGOs focus their operations around the province's more accessible and central locations. This is evident from Figure 4.2 (overleaf) which shows that those regions on major transportation routes and which constitute entrance points to islands, such as Kupang, East Sumba and the regions of Central Flores (Ngada, Ende and Sikka) are better serviced by NGOs than isolated regions, distant from these routes, such as West Sumba, East Flores, Manggarai and the interior mountainous regions of Timor.

4.1.2 Explanation of observed characteristics of NTT's NGO community

The recent boom of NGO numbers in NTT is related to the international trend towards increasing the role of NGOs in development interventions. In the same manner that observers of NTT's development condition (including local and foreign theorists and practitioners) have followed international opinion by supporting the promotion of agroforestry technologies to intensify agriculture, they have also argued for increased grassroots participation in the development process and consequently for a greater role to be taken by NGOs.

It has been recommended that increased participation in NTT should involve modifications to the structure of the Indonesian government so as to reduce centralised planning and increased recipient community involvement in all development interventions (BANGDES and UNDANA 1986: 74, Boeky 1991: 71, FAO 1992, Susanto 1992). It is believed that greater participation will enhance achievement of village development goals. In NTT however, as elsewhere, it has been difficult to achieve the level of participation desired. Moffat (1991: 206) said in his assessment of one of NTT's largest development projects, the Nusa Tenggara Timur Integrated Area Development Project (NTTIADP), that physical targets were easy to achieve but that it was very difficult to encourage recipient participation, even though the project had the intention of doing so. It is this desire to facilitate greater participation, but the absence of a model that can be used to achieve this goal other than the internationally

Figure 4.2: Number of NGOs per 100,000 people in each region of NTT



popular model of establishing and utilising NGOs, that has created an environment in NTT favourable to the observed "NGO boom".

NGO's in NTT declare that they are involved in service provision rather than representation or advocacy functions for a number of reasons. First, involvement in service provision is one of the reasons why both government and development observers recommended NGO involvement in the first instance, hence, there has been more support for NGOs undertaking such functions. It has been widely asserted that NGOs should get involved in service provision so that services provided are truly consistent with local desires and needs, thereby increasing project success (BAPPEDA and Lynch 1988: 36, Barlow 1991, Barlow and Gondowarsito 1991: 29, Djemarut 1991: 183). Service provision is also attractive due to the prevailing political environment in Indonesia, which may result in representation functions being interpreted as anti-government, thereby threatening NGO establishment. NGOs must be acutely aware of their image because of ill-feeling between the NGO community and individual Indonesian government staff. The Indonesian government as a whole is said to be supportive of NGO activities, and has given them considerable operational freedom to carry out activities related to service provision (Hani 1992). Individual government staff however, have often treated NGOs and their personnel with suspicion, jealousy and dislike (Cunha 1992). These feelings arise because government staff view NGOs as opposition, threatening the former's historical dominance over development initiatives (Kleden 1992). Hostility of this kind has perhaps increased the conformity of NGOs to approved roles so that those disliking them are not provided with ammunition that can be used to threaten their acceptance and funding in the future.[1]

The focussing of NGO operations in NTT's central, accessible regions seems to indicate that agency location is more strongly related to where available funds and human resources can

[1] Many NGOs, while not formally declaring that they provide the rural poor with representation and advocacy, actually do this in their daily activities. For example, while concentrating on its declared programme of agricultural intensification and soil and water conservation, YTN also provided representation to some of the groups with whom it was working by formally relaying their concerns regarding resettlement from forest areas to the regional Forestry Department.

be obtained rather than to where the poor and isolated reside. Table 4.2 shows that the regions best serviced by NGOs are also those with the highest proportion of graduates from tertiary education. This may have no relationship to NGO location and may merely be a coincidental result of these regions having greatest access to tertiary education. It may also however, be related to NGO location, in that NGOs not only use tertiary graduates as staff, but are often created as a result of inspiration from people of these backgrounds. In contrast, Table 4.2 also illustrates that the number of NGOs in a region is not directly related to poverty. East Flores has the largest percentage of its population living in poverty but has the least attention from NGOs, while Kupang, East Sumba and Ngada have comparatively fewer poor as a percentage of their populations but are well serviced by NGOs.

Table 4.2: Comparison of regions best serviced by NGOs to tertiary education and poverty characteristics of these regions

Region, ranked according to best NGO:population ratio	No. of NGOs	Region ranked according to % of the population which has graduated from tertiary education (from most graduates to least graduates)	Region ranked according to % of the population which is poor (from most poor to least poor)[1]	Region ranked according to welfare of the population (from least well off to most well off)[2]
Kupang	25	Kupang	East Flores	TTS
Ngada	9	Ende	Alor	Belu
Ende	8	Sikka	West Sumba	Sikka
Alor	5	East Sumba	Sikka	West Sumba
East Sumba	5	Ngada	Ende	Alor
Sikka	8	Alor	Manggarai	East Flores
TTU	4	TTU	Belu	Manggarai
Belu	5	West Sumba	Ngada	TTU
TTS	7	Manggarai	TTS	Ngada
West Sumba	5	TTS	Kupang	Ende
Manggarai	8	East Flores	TTU	East Sumba
East Flores	4	Belu	East Sumba	Kupang

[1] "Poor" equals population below the poverty line determined for NTT and expressed in Kantor Statistik (1991b) as Rp 17381 per month for urban residents and Rp 10294 per month for rural residents.

[2] "Welfare" of the population in each region was determined by Kantor Statistik (1991b) by considering the following factors: birth and death rate; illiteracy and level of education; employment characteristics; population's consumption and expenditure characteristics; involvement in family planning; number of doctors per head of population; percentage of population below the poverty line; income; and condition of individual's residences.

Note: There is no contradiction between this table and Table 3.2 of Chapter 3 which indicates the relative need of study villages. The concept of need referred to in the latter table is a relative one, and while a study village may be 'in need' in comparison to other villages in East Sumba, it may be 'less in need' when compared to a village in East Flores.

Source: Kantor Statistik 1991b, BKKKS and OXFAM 1992.

4.1.3 Competition and conflict as a cause and consequence of NGO characteristics

In NTT the characteristics of NGOs outlined above, reflect and create an air of competition and conflict within the NGO community. The similarity between NGO programmes, the fact that most NGOs are still new and seeking to establish their reputations, and their large number (meaning that they often work in close proximity and sometimes even in the same villages) causes this competition and conflict. When coupled with the pressure placed on NGOs by the high expectations of experts recommending their use and the animosity emanating from individual government staff, it becomes crucial that agencies ensure that their own programmes are acceptable. They must also appear to succeed, not only individually but in relation to the programmes of other agencies, so that their future funding and approval is assured and opportunities are opened to them.

This competition and conflict therefore, perhaps contributes to NGOs locating in central locations because it is here that their projects can attract the most attention. The sorts of conflicts emerging include NGOs with different approaches interfering with one another because of their desire to secure the support of a recipient community and immediate programme success. It has been reported for example, that organisations engage in unsustainable approaches by providing food incentives to recipients in order to ensure programme adoption by these people. Unfortunately, the use of these approaches has significantly constrained NGOs operating in nearby communities which are trying to use approaches encouraging self-reliance (Yayasan Tananua 1992: 21).

4.2 Background, physical technologies and methodological innovations of YTN

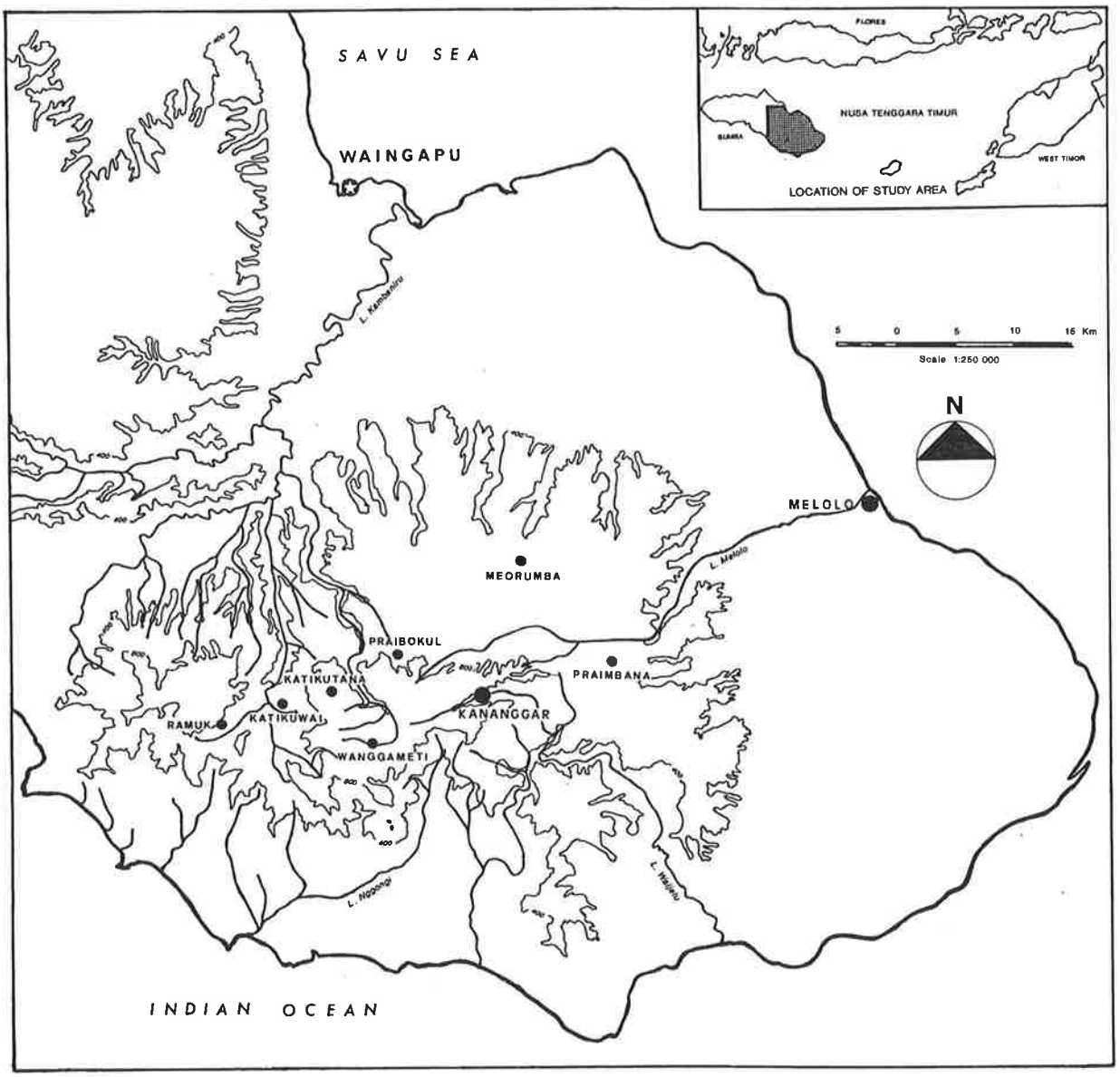
4.2.1 General description of YTN's major area of operation

It is in this atmosphere of competition and conflict between NGOs, where agencies require comparative success to satisfy the expectations of supporters, quell the criticisms of detractors and open future opportunities for expansion, that Yayasan Tananua exists. YTN is a local NGO operative on the three major islands of NTT (Timor, Flores and Sumba). The centre of its activities lies in East Sumba. At the time of data collection YTN was working in seventeen villages, ten of which were in the upland mountainous district of Paberiwai, three in Tabundung, two in Lewa and one each in Pandawai and Rindi-Umalulu (Yayasan Tananua 1992: 1). Latest reports indicate that in the last two years YTN has expanded into another twelve villages (including one in West Sumba), bringing to twenty-nine the total number serviced in Sumba (Yayasan Tananua 1994: 40). Figure 4.3 (overleaf) shows the locations of the study villages. This map shows that they are in an area remote from Waingapu and at the head of East Sumba's largest water catchment from which many of its major rivers drain. Although the concentration of villages serviced in other areas has increased, approximately half of the villages attended continue to be in these central mountains of Paberiwai.

One hundred years ago Kate (1894: 564) described the northern reaches of the Paberiwai region (derived from the traditional kingdom of Mahu) in the following terms,

> "The entire northern area of Masu is constituted by hills... Robust, spherical and horizontal layers with few conspicuous peaks, covered by sallow, faded, weak greenish-yellow grass from the top to bottom can be seen. Here and there on the mountain tops and in the ravines dark stripes indicate heavy forest; for as far as the eye can see there is a total absence of houses and people. Masu is the "cold land" (*tanah maringu*) of Sumba, it is deathly quiet, but not without a certain beauty."
> (author's translation)

Figure 4.3: Location of the study villages in East Sumba



These features described by Kate continue to dominate the initial observations of contemporary visitors to the area. Undulation, grasslands and restricted areas of forest prevail, and the "cold land" still chills its guests not only because of its lower temperatures but because of feelings generated by the loneliness of its landscape. The following gives a general description of this region in which YTN focusses its activities.

a) Soils and Topography

Duggan (1991: 33) indicates that the soils of Sumba and Timor (the outer Banda Arc Islands) are marine in origin or derived from marine sediments including clay beds, coral, limestones and marls. They have given rise to particular soil types including cracking clays, red earths, and lithosols, all of which are predominantly calcareous. These sediments were raised from the sea floor in a process of uplift that began 25 million years ago and continues to this day. The northern coastal area of East Sumba consists of quaternary reef-based limestone overlaid by black soils. These soils are reasonably fertile but shallow, varying from just 30-100 mm in depth above the limestone base (BAPPEDA and Lynch 1988: 5). The southern area around Nggongi has volcanic and basalt-based soils, while the central mountain area contains limestone and areas of red loam and fine grained shining sandstone.

The highly calcareous nature of the soils results in phosphorous fixation and soil pH ranging from 8-9 with some soils being sodic. These soils are infertile, being low in organic matter and nitrogen and often having iron and zinc deficiencies (Pellokila *et al* 1991: 125). They also have a low water retention capacity, making them more prone to drought than the soils of other islands in NTT, such as Flores (FAO 1992). Overall, Sumba's soils are also shallow with seventy-five per cent of the total land area having a soil depth of between zero and 300 mm (BAPPEDA 1986: 8-9).

Throughout East Sumba the topography is hilly to mountainous. Twenty-seven per cent of the total land area has a slope greater than 40 percent, and another forty-one percent of the

total land area slopes from 15-40 per cent (BAPPEDA 1986: 8-9). Paberiwai is particularly steep with low peaks being deeply dissected by river courses.

b) Rainfall

Rainfall in East Sumba is limited, falling in one short, intense rainy season from December to March. It is also highly unreliable with two week 'droughts' being able to occur at any time during this wet season (Pellokilla *et al* 1991: 123). For most of the year, from April to November, dry conditions prevail. Average rainfall figures for select villages in districts across East Sumba are shown in Table 4.3. Tana Rara in Paberiwai recorded an average of just 1,136 mm for each of the ten years from 1975 to 1984. This is very little given the soil's low water retention capacity, the district's high potential evaporation and the quantities of rainfall received by other tropical regions.

Table 4.3: Average annual rainfall over ten years in select villages across East Sumba

Location - Desa & Kecamatan	Average Annual Rainfall 1975-84 (mm)	Actual 1987 (mm)
Ngallu (Pahungalodu)	1111	1080
Mellolo (Rindi Umalulu)	1190	-
Wanga (Rindi Umalulu)	1109	617
Tana Rara (Paberiwai)	**1136**	**3902**
SPP Lindiwatu (Lewa)	1875	1715
Mataiyang (Lewa)	2178	2110
Prai Lui (Pandawai)	981	562
Mau Hau (Pandawai)	1082	-
Lambanapu (Pandawai)	1131	-

Source: BAPPEDA and Lynch 1988: 6.

c) People

"Deathly quiet", as described by Kate, persists in Paberiwai which has a total population of 23,047 persons at a density of just 14 persons per square kilometre.[2] This

[2] These figures from BAPPEDA and Lynch (1988: 4) are for Mahu-Karera, that is, Paberiwai and the Perwakilan Kecamatan of Paberiwai, constituted by the traditional kingdom of Karera on Sumba's south coast.

population is spread evenly across the landscape according to the availability of land suitable for agriculture. Almost all residents are farmers who prefer to work small areas of flat, fertile and/or well watered land occurring at the edge of rivers or springs. However, this land type is scarce and most farmers must engage in dryland shifting cultivation on steep mountain slopes. This shifting cultivation involves moving plots every two to five years. Productivity of this system is low and yields vary greatly from year to year depending on available rainfall and the occurrence of other biophysical constraints. As residents of Paberiwai retain strong connections with their traditions, including their traditional rights to land, they continue to locate these dryland gardens at the boundaries of forest areas, despite regulations from the Indonesian state prohibiting cultivation in the forest zone.

The persistence of Sumbanese traditions is also reflected in the ongoing strength of their traditional religion and class system. The traditional religion of "*Marapu*", sometimes referred to as animism, is actually a form of ancestor worship (Kapita 1976: 14, Adams 1980: 209). This leads the Sumbanese to value highly, particular places where their ancestors lived and are buried. Reports as to the exact number of people still believing in *Marapu* vary significantly. BAPPEDA (1986: 13) reported that 43 percent of East Sumba's population still adhered to the *Marapu* faith, while Forth (1981: 9) estimated the number of believers to be more than 66 percent. Adherence to the Sumbanese system of class/caste, is related to continued belief in *Marapu*, with followers of *Marapu* appearing more likely to strictly observe the class system. Determined by heredity, there are three general classes of people in Sumba, the *Maramba* (nobles), *Kabihu* (freemen) and *Ata* (slaves). Each of these classes has two divisions, meaning that there are six classes altogether (Kapita 1976: 19). Even in locations where less importance is attributed to this class system, the class background of all residents of Paberiwai continues to be known by others in their community. This background affects the respect individuals are afforded and influences their opportunities in important life events, such as marriage. The respective conditions and obligations of class members to others within and outside of their class is discussed in Chapter 5, section 5.3.4.

In terms of infrastructure and commercial development, Paberiwai and the whole central mountain area is the most backward in the region. East Sumba has three zones of varying development. The area around Waingapu is the first and wealthiest zone. The second zone is constituted by the northern coastal strip which stretches from Waingapu to Mellolo. This zone has good communication, trade and information flows, and the people are integrated into a cash economy and think commercially. The central mountains are the third zone. They have little infrastructure development, in terms of few connecting roads, and no electricity nor piped water in most locations. Residents remain subsistence oriented and sell few goods due to the difficulty of getting them to market.

d) Vegetation

The entire northern coastal plain of East Sumba was converted from forest to grassland long ago. The loss of forest from this plain and from the hills leading up to the central mountains is believed to have been added to by the exploitation of sandalwood (*Santalum album*). Chinese and Indian traders commenced small scale trade with Sumba in the eighth century and did so regularly from the eleventh century. This was then continued by the Portugese and Dutch in the sixteenth and seventeenth centuries (Kisscon and Carrier 1991: 8). Sandalwood exploitation reached its peak in 1662 when the Dutch involved themselves fully in the activity (Kapita 1976: 12). By the time of Kate's visit the northern region of East Sumba was a "monotonous grazing plateau" (Kate 1894: 567), with trees being restricted to small areas along the water courses (Roos 1872: 42). Today, as a result of annual burning and continual grazing, the northern plain (especially during the dry season) has become more like a stony desert than a grassland.

In the central mountains of Paberiwai and the south coast of Karera however, there are reasonably large areas of remnant forest. These forests stretch from Manggili across Karera to Tabundung covering the top and southern slopes of the mountain range which has Palindi Wanggameti at its centre (Sumba's highest mountain). The 6,000 hectare forest around Palindi

Wanggameti is said to be one of the best and least disturbed moist forests on the island, representing a diverse range of altitudes and containing most of Sumba's eight endemic bird species (UNDP/FAO 1982a). Paberiwai is also characterised by fertile *Chromolaena odorata* shrublands and *Imperata cylindrica* grasslands which have been recently converted from forest. Nevertheless, degraded grasslands that have long been subject to grazing and burning and which are dominated by *Mapu* grasses (*Themeda sp.*) continue to dominate much of the landscape, especially on Paberiwai's flattish peaks.

e) Summary of problems in Paberiwai

From an outsider's perspective, the major problem experienced by Paberiwai's people appears to be material poverty resulting from their dependence on an agricultural system of low productivity, and their isolation from the forces of change and development in East Sumba due to distance from the region's major development zones. This condition could further deteriorate due to environmental problems arising from the effects of their livelihood system on Sumba's fragile environment. Erosion, for example, is a significant problem being enhanced by the steepness of the land that farmers cultivate, the nature of the soils, seismic activity, high intensity rainfall, exposure of the soil after annual burning, and destabilization of slopes caused by cattle tracks and pads.

The environmental degradation of Paberiwai is a problem concerning those living outside of the district as well as local people. Further conversion of Paberiwai's forests into farm plots and grazing lands worries conservationists because of their ecological sigificance and distinctiveness from the forests of all other Indonesian islands (UNDP/FAO 1982a, Banilodu and Saka 1993). Forest loss in Paberiwai is also of major importance for those residing at Waingapu and on East Sumba's north coast. Paberiwai is the water catchment for all of East Sumba's major rivers and in particular is the source of Luku Kambaniru. This is the region's largest river and it supports Waingapu's urban settlement and sizeable vegetable gardens along its banks in Waingapu's hinterland. Dependence on the Kambaniru will increase in the future because a dam

building project aiming to irrigate 1,440 hectares of the coastal plain near Waingapu with its water, is currently nearing completion (Bali Post 1994: 5). Due to the importance of the water coming from Paberiwai to the people living on the dry north coast, it is crucial that environmental problems in the central mountains are arrested and the water catchment preserved.

4.2.2 Origins, aims and funding of YTN

YTN came into existence in 1985 to continue the programme initiated in 1982 by the North American NGO World Neighbours (WN), in the central mountains of East Sumba. YTN lists its aims as improving the conditions of village people and increasing their self-reliance through activities related to dryland agriculture and village organisation (BKKKS/OXFAM 1992: 192). These aims are closely tied to the overall programme goals of WN. These goals, as recently reiterated, are,

> "To strengthen the capacity of marginal upland communities to meet their basic needs. Primary emphasis will be on the development of productive, sustainable, and comprehensive upland farm management and community based health care systems, and to achieve the widespread adoption of these practices to improve the quality of life in these communities." (Wodicka *et al,* 1994: 1)

and,

> "To build leadership and local organizational capacity, increase communication and solidarity, and encourage coalition building and more effective inter-agency collaboration in order to address additional community development goals, to widen program impact, and to influence relevant policy issues." (Fisher *et al*, 1993: 2)

Although YTN is now considered an autonomous partner of WN, it retains a highly dependent relationship with its parent body. WN continues to be its major source of direct funding and provides it with technical and organisational advice. Furthermore, due to the extent of funding, WN makes frequent assessments of YTN's progress via their area representative

stationed in Bali. YTN's continued reliance on WN for funds, well into the 1990s, is illustrated in Table 4.4 which shows that around 85 percent of YTN's income comes directly from WN.

Table 4.4: Disbursements from World Neighbours to Yayasan Tananua in 1991/1992 and 1992/1993[1]

YTN office	Amount (Rp)[2]		WN funds as a percentage of total income received by YTN[3]	
	1991/1992	1992/1993	1991/1992	1992/1993
Sumba	44,277,700	58,617,400	83.2	82.6
Flores	29,592,300	34,909,400	91.7	65.7
Timor	13,031,530	18,135,271	83.2	98.1
Total	**86,901,530**	**111,662,071**	**86.0**	**82.1**

1 Financial data was omitted from YTN's 1993/1994 annual report.
2 In late 1994 one US dollar equalled Rp 2140.
3 Total income not including balance from previous year.

Source: Yayasan Tananua 1992, 1993.

Nevertheless, attempts are currently being made to diversify YTN's funding sources. Some funds are now coming from CUSO, and in the future YTN/WN will be seeking funds from and/or forging stronger links with OXFAM UK (Indonesia), the Unitarian Service Committee, the Asia Pacific Agroforestry Network/FAO and ILEIA (Netherlands) (Fisher *et al*, 1993: 8). The Ford Foundation also supports YTN by providing funds to World Neighbours and the Nusa Tenggara Uplands Development Consortium of which YTN is a member. In the future YTN's media initiatives will be funded primarily through specific per-project media grants from CUSO, World Education, the Ford Foundation and other donors (Fisher *et al,* 1993: 12). There is also an awareness amongst YTN's leaders of the need for the organisation to generate its own funds. Methods identified for achieving this long term goal have included the sale of seed from tree legumes which in 1991/1992 and 1992/1993 generated Rp 6.5 million for YTN's Sumba branch (approximately 5 percent of its total income over these two years). Other funding initiatives include the sale of publications produced by the organisation and the provision of consulting services to other agencies.

4.2.3 Technologies promoted by YTN

a) Technologies currently popular in the YTN programme

YTN has identified a range of technologies to achieve productive and sustainable farms that can improve local people's conditions and increase their self-reliance. Technologies currently popular include terracing, improving agricultural production by increasing land fertility and using in-row tillage, planting horticultural and estate trees, and undertaking small scale regreening by establishing 'family forests'. YTN's terracing technology encourages farmers to make 'credit' terraces on steep land. These differ from bench terraces in that earth is merely raised into mounds along the contour line (which farmers are taught to identify using a wooden A-frame). Although neither permanent nor substantial, these credit terraces assist planting and water retention, and reduce slope. On the terraces farmers plant tree legumes which grow into hedgerows. Predominant legume species used include red calliandra (*Calliandra calothyrsus*), *gamal* (*Gliricidia sepium*), white calliandra (*Calliandra tetragona*) and flemingia (*Flemingia macrophylla*). These hedgerows are for initial terrace stabilisation (prevent erosion), shelter of other crops, soil fertility, livestock fodder and fuelwood. Figures 4.4.1 and 4.4.2 illustrate the nature of credit terraces and the method with which tree legumes are planted upon them.

Figure 4.4.1: Representation of YTN's credit terrace and tree-planting technology

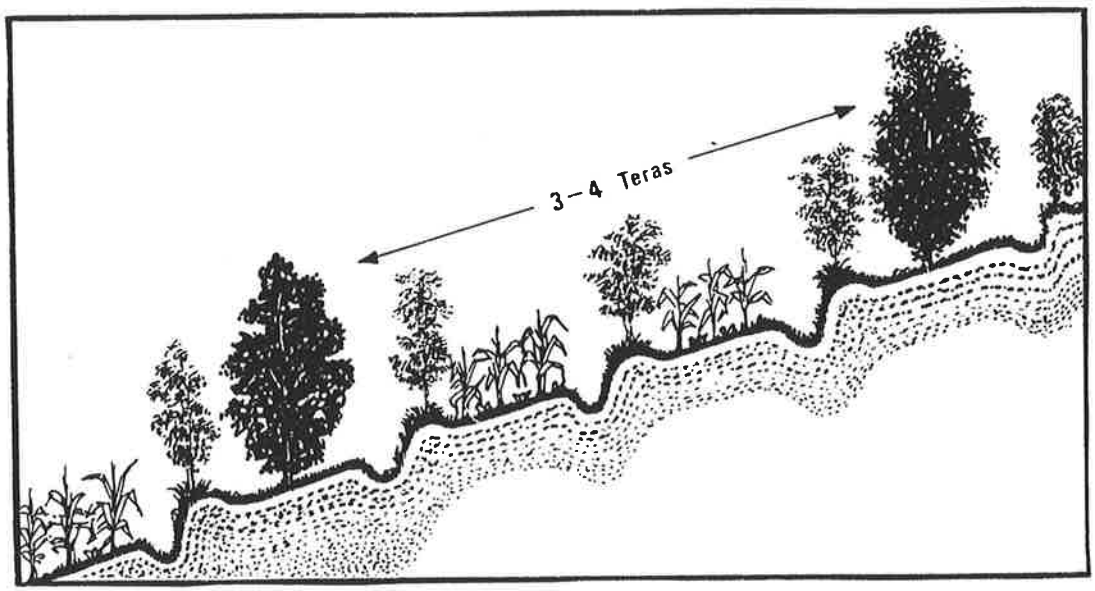
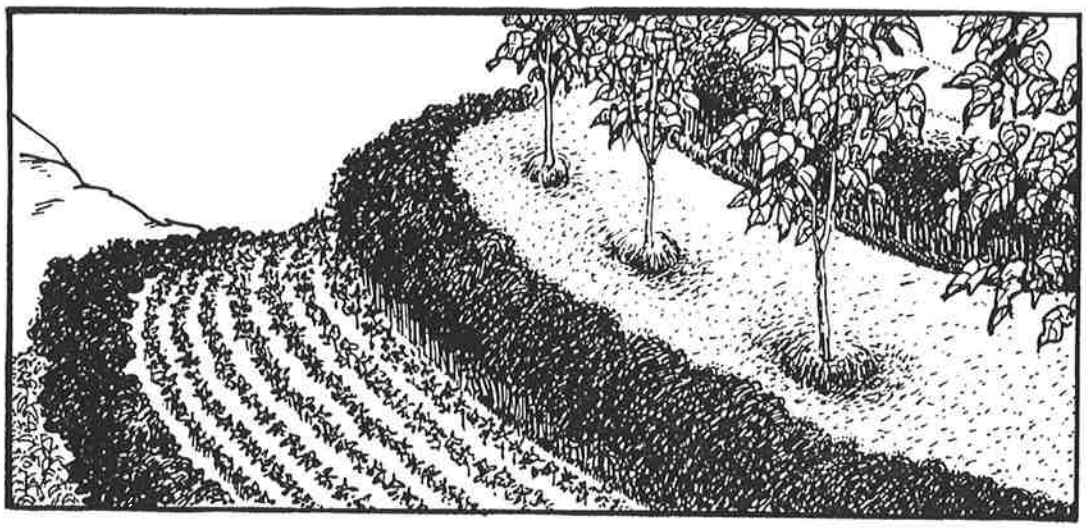


Figure 4.4.2: Planting of annual and perennial crops between legume hedgerows



Source of both figures: World Neighbours and Studio Driya Media (1988: 25)

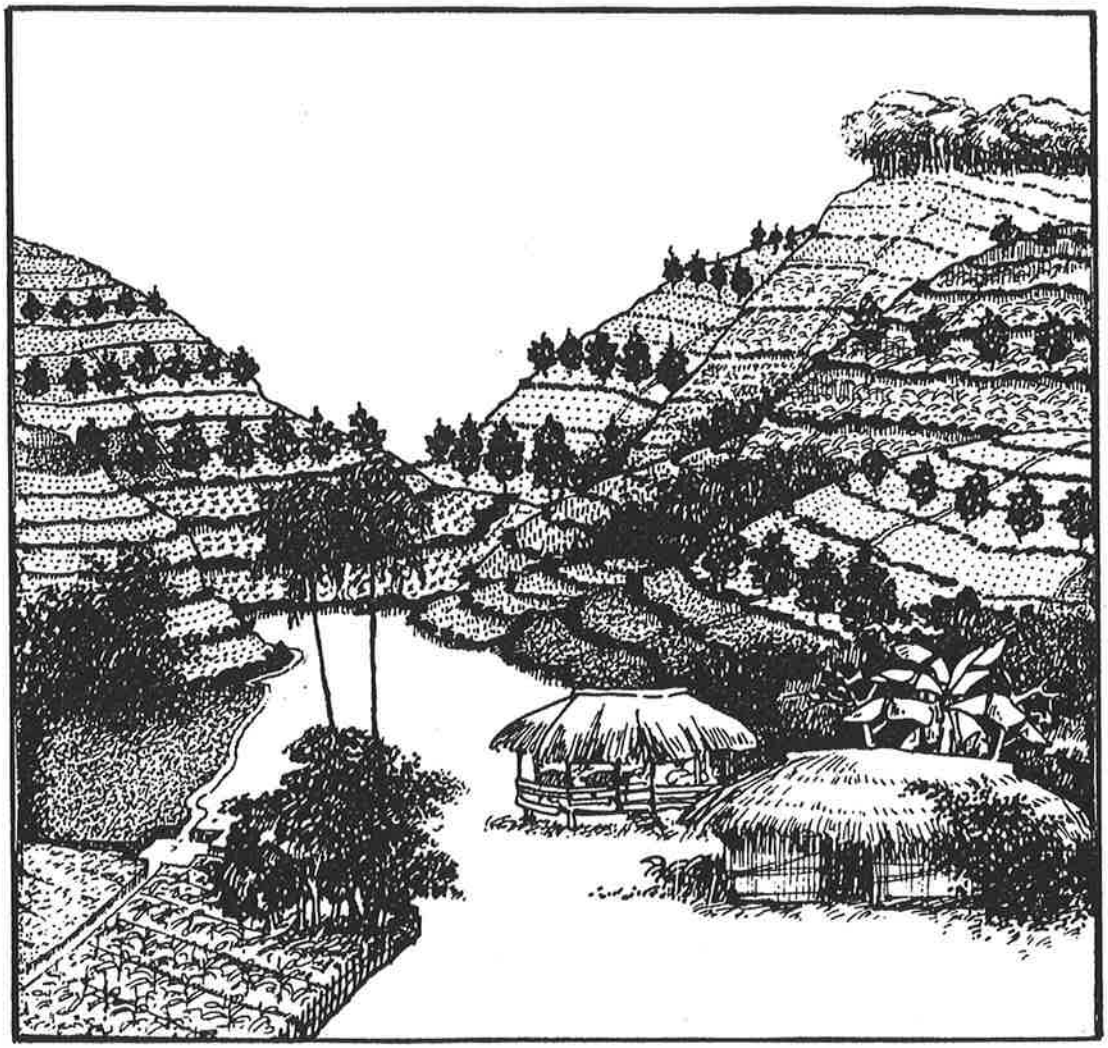
To improve agricultural productivity farmers are encouraged to intercrop the hedgerows in an alleycropping system. Before and during the planting of food crops the tree legumes are cut back and the clippings used as mulch. YTN promotes a more complicated in-row tillage system which involves making a ditch 30-50 cm deep by 30-50 cm wide between credit terraces, filling the ditch with manure and legume clippings ('green manure'), leaving the organic material to decompose, and then using it to plant food crops.

YTN also provides farmers with extension and materials to establish stands of horticultural and estate trees. Horticultural trees provided include *rambutan* (*Nephelium lappaceum*), mango (*Mangifera indica*), cinnamon (*Cinnamomum zeylanicum*), *salak* (*Zalacca edulis*), guava (*Psidium guajava*), avocado (*Persea americana*) and *durian* (*Durio zibethinus*). Estate crops and trees promoted include clove (*Eugenia aromatica*), coffee (*Coffea arabica* and *Coffea robusta*), cocoa (*Theobroma cacao*), vanilla (*Vanilla fragrens*), coconut (*Cocos nucifera*), cashew (*Anacardium occidentale*), pepper (*Piper nigrum*), nutmeg (*Myristica fragrans*) and areca nut (*Areca catechu*). The organisation also encourages farmers to create their own 'family forests' with trees that can meet their future timber needs, such as mahogany (*Swietenia macrophylla*), *johar* (*Cassia siamea*), *saga* (*Adenanthera pavonina*), teak (*Tectona grandis*) and a

variety of local trees found in Sumba's forests and savannah. All of the trees are planted on land owned by farmers and are possessed entirely by the landowner.

When individual households adopt all of the technologies mentioned above, it is intended by the organisation that their needs would have been catered for in the short, medium and long terms. Tree legumes meet their short term needs for fodder, fuelwood and green manure, horticultural and estate trees meet farmers' needs in the middle term and family forests supply their long term needs for timber. Figure 4.5, illustrates the integrated farming system which can be achieved when its various technologies are implemented in conjunction.

Figure 4.5: Integrated farming system, dependent upon terracing, that is promoted by YTN



Source: World Neighbours and Studio Driya Media (1988: 6)

b) Evolution and alteration of WN/YTN technologies since 1982

Despite the complimentary and integrated nature of the current repertoire of physical technologies, this was not always the case, and there has been an evolution and alteration of some of the dominant technologies since WN commenced activities. As initially conceived by WN in 1982 the programme had a water supply component, provided farmers with horticultural trees and encouraged *lamtoronisasi*, that is, the making of terraces and then planting them with *lamtoro* (*Leucaena glauca*).

The water supply component of this initial programme involved sinking wells in seven villages. These were constructed using labour from the village serviced, technical knowledge from the NGO and cement from government. A considerable number of wells (complete with hand-pump) were constructed, including twenty in the village of Lailunggi alone. The initial provision of horticultural trees supplied farmers with seedlings of guava, avocado and numerous varieties of mango. These were bought from Java at prices ranging from Rp 1,750-5,000 and then sold to those farmers who wanted them at a standard price of Rp 1,500. The terracing component of the programme taught interested farmers how to make terraces and hedgerows, and then provided materials to those who wished to implement what they had learnt in their own communities.

By 1985 however, both the water supply component of the programme and the initial method of providing horticultural trees seem to have fallen out of favour with WN planners. As originally conceived these components were no longer promoted in newly serviced villages. Reasons for this are unclear but the deterioration of some wells and breakdown of all hand-pumps that has now occurred may have been apparent to planners from an early date and thus indicated that this technology was inconsistent with the principles of appropriate technology. Similarly the continual purchase of horticultural seedlings may have been seen as either unsustainable or inconsistent with the concept of self-reliance.

Nevertheless, despite altering the method of distribution, WN/YTN continued supplying horticultural trees from 1986 onwards. Although seedlings were still provided and some of these continued to be sold, there was a shift in emphasis towards getting individual farm households to nurse their own saplings from seed. In 1986 YTN also commenced encouraging farmers to nurse and plant estate trees. As a part of this process of evolution, it was not until 1989 that YTN formalised the concept of 'family forests' and began promoting this activity.

The programme's most stable technology has been the construction of terraces and their planting with tree legume hedgerows. This activity has proceeded unabated from 1982 until the present. Nevertheless, even this technology has undergone some modification. An initial emphasis on the construction of bench terraces was abandoned in preference for less laborious credit terraces, and in 1986, as a result of *lamtoro's* decimation by a psyllid pest (*Heteropsylla cubana*), a principle of diversification was adopted which led to the planting of the range of tree legumes listed above. The most recent modification to the terracing system has been the introduction of in-row tillage to better utilise both the area between hedgerows and their clippings.

4.2.4 Methodological approach of YTN

YTN's purported approach to the promotion of the above technologies (summarised by Suardika and Fisher 1990: 141) adheres to the participatory principles of WN (as outlined by Bunch 1982). Technologies are selected consistent with farmers' felt needs. These needs are assessed by extensionists who live with the intended recipients so that channels of communication are informal and open. Chosen technologies must encourage farmers to be self-reliant and not become dependent on the organisation and they should develop existing resources. They must also be simple and easy to understand, cheap, safe and functional in order to enhance subsistence farmer attraction.

Villages serviced by YTN are selected according to four criteria. YTN's programme coordinator said that the most important of these is a request from somebody living in a particular village inviting the organisation to commence activities there. Having received such a request YTN's decision to enter the village is influenced by the amount of attention that it has received from government projects in the past (with more neglected villages being given higher priority) and whether the village is one of significant need which requires development projects to improve poor conditions. Finally, YTN is more likely to enter a village if there is a possibility that from that location there will be spontaneous diffusion of their technologies to other areas and communities.

Within selected villages extension to farmers normally begins in groups and then later is given on an individual basis. Only those farmers however, with a strong desire to adopt and use the technology are encouraged to do so and even these farmers are advised to keep the technology small in scale. It is asserted that it is thus common for just 5-10 families in a community to be serviced in YTN's first year of operation in a village (Sinaga 1990: 4). Discouraging those without high desire reduces the likelihood of failure and so protects the organisation's reputation in its infancy. Limiting the scale of adoption minimises damage in the event of failure. Extension officers give great attention to the pioneer adopters so that their gardens can provide an example to and inspire other farmers. Extension officers also have their own example gardens that perform this function. Farmers who have not yet adopted the technology are encouraged to observe their gardens and receive practical instruction.

It is emphasised that the technology is spread by increasing farmer understanding and desire and does not involve any force or coercion (stated by Suardika and Fisher 1990: 142, "*Penyebaran... tidak ada unsur paksaan.*"). Extensionists use slides and comic books to spread the technology and it is stated that they encounter farmers not only during formal meetings but also in farmers' own fields which is important to give practical demonstrations. It is also said that there is spontaneous dissemination via family linkages.

After the programme is established in a village YTN gives those farmers who have adopted the technology "*kesempatan promosi*" or opportunities to be promoted into the organisation as farmer extensionists (Sinaga 1990: 5). From there they can rise further to the position of field extension officer. Criteria for becoming a farmer extensionist include having frequently attended YTN's quarterly farmers' meetings, having demonstrated leadership ability (as evidenced by the candidate's history of assisting others with advice and by the eagerness with which neighbouring farmers want the candidate to become an extensionist), and having a garden consistent with programme principles that can be an example to others. Finally, candidates must be prepared to spend two days a week, or ten days a month, attending to farmers in their area (Sinaga pers. comm.). This system of promoting recipient farmers into paid positions within the organisation is intended to generate competition amongst recipients to see who can become the best farmer amongst their peers (Sinaga 1990: 5). It also develops a sustainable source of extension in the village and increases opportunities for all farmers to join in programme evaluation because of the ease of communicating with this familiar local who is always present at the village level.

YTN considers quarterly farmers' meetings as the most important event of their programme (Sinaga recorded in World Neighbours, 1991: 14). These meetings are rotated amongst villages serviced by YTN and are attended by YTN staff, local leaders, government officials and farmers from all participant villages. Each participant gives a full report detailing what is happening in their communities and on their farms. There is then discussion and questions from other participants in response to each report. As well as increasing farmer understanding and broadening their experience it is said that the most important monitoring and evaluation occurs during these meetings (Sinaga recorded in World Neighbours, 1991: 14). Programme evaluation occurs through analysis of reports given by ordinary farmers and representations made by farmer extensionists or extension officers on behalf of their communities.

A final component of YTN's approach is the use of cross visits. These visits, which are entirely funded and arranged by the organisation, take select farmers from Sumba to Timor, Flores and locations outside of the province and bring farmers from those locations to Sumba. These visits increase farmers' experience by allowing them to witness new technologies and different applications of familiar technologies, and to exchange information with their counterparts from distant locations.

4.3 Conclusion

This introduction to Yayasan Tananua has described the technological and methodological components of its programme and has outlined the contexts in which it was formed and is operating. This serves three major purposes in relation to the following chapters. First, the identification of the fact that YTN's aims and activities give as much importance to organisational and institutional change at the village level, as they do to transfer of physical technologies, justifies examination of YTN as an agency aiming at encouraging and prioritising participation. Second, specific description of the study area, YTN's technology and its methodological approach provides essential background which will be continually referred to during the following analysis of participation. Finally, reference to the context in which YTN was formed and the context in which it is operating has introduced factors to be referred to when explaining why the participatory characteristics of YTN's approach take their observed form. Of particular importance is the atmosphere of competition and conflict which characterises NTT's NGO community, and YTN's close relationship with its donors from the time of inception until the present.



Plate 1: Mountainous topography of Paberiwai, at Kawingu, Desa Katikutana.



Plate 2: Corn planted in a traditional manner over steep slopes, at Kallala Desa Praimbana.



Plate 3: Moist forest atop Palindi Wanggameti. An area of high ecological value.

Plate 4: Trees at the edge of the Wanggameti forest burnt as a result of the firing of the adjacent grasslands.





Plate 5: Fodder is provided by the succulent green shoots which emerge after burning.

Plate 6: Luku Kambaniru, the major source of water for Waingapu, originates in the forests of Paberiwai, meaning their preservation is crucial for urban dwellers also.





Plate 7: *Alang-alang* grasslands (*Imperata cylindrica*) continue to thrive in Lakombu, Desa Meorumba.

Plate 8: At Laru, Desa Katikuwai, *Chromolaena odorata* has outcompeted *alang-alang* and is thriving on land recently converted from forest.





Plate 9: Field of corn and dryland rice intercropped with rows of red calliandra (*Calliandra calothyrus*) made under the guidance of YTN at Laiwinu, Desa Praibokul.

Plate 10: On this fairly flat site, rows of legumes are spaced at 4 to 5 metres. Using this alleycropping method on flatter land where the trees can be well spaced is more popular amongst farmers.





Plate 11: Alleycropping garden surrounded by a fence of red calliandra at Hambongu, Desa Wanggameti.

Plate 12: Rows of *lamtoro* trees (*Leucaena leucocephala*) have been planted in this field in Pinduwatu, Desa Katikutana. Trees are left to grow tall every few metres so that they may produce seed.



CHAPTER 5

ANALYSIS OF PARTICIPATION

5.1 Introduction

This chapter analyses the type of participation used by YTN. First, the extent of adoption of particular YTN technologies in recipient villages in Sumba is described. The major task of determining whether the NGO encouraged this adoption via the use of a participatory approach is then undertaken. Participation facilitated by YTN is analysed by comparing farmers' perceived needs and desires to what has been provided by and adopted from YTN, by examining the nature of farmer requests to the organisation, examining farmer feedback and actions taken on that feedback, and by observing the equality of participation. After analysing the degree of participation actually contained in YTN's approach, underlying reasons for the observed outcomes are sought.

5.2 Extent of adoption of YTN's programme and technologies

YTN's programme has been adopted extensively in Sumba. At the beginning of data collection there were approximately thirteen villages following the programme. However, popularity has increased dramatically in the last two years. This has resulted in the number of participant villages growing to twenty-nine at the end of 1994, as listed in Table 5.1 (overleaf). The vast majority of these villages continue to be in the mountainous uplands of East Sumba but there has also been spread to one village in West Sumba. Table 5.1 shows that within YTN serviced villages the number of individual households following the programme has increased steadily, except in some instances where numbers decreased slightly from 1992/93 to 1993/94. In those villages where YTN has been operative for some time the percentage of all

Table 5.1: Extent and nature of adoption of YTN technologies by individual households in villages of Sumba, as reported by YTN

Village	Year YTN began in village	Total house holds 1991	YTN following households			Terraces with Hedgerows			Horticultural Trees			Estate Trees			Family Forest			Grasses			In-row Tillage		
			Year			Year			Year			Year			Year			Year			Year		
			91/92	92/93	93/94	91/92	92/93	93/94	91/92	92/93	93/94	91/92	92/93	93/94	91/92	92/93	93/94	91/92	92/93	93/94	91/92	92/93	93/94
Ramuk	1982	217	194	231	214	194	225	n.d.	93	n.d.	yes	71	76	yes	13	19	yes	9	9	n.d.	12	12	n.d.
Katikuwai	1985	163	114	154	139	114	123	n.d.	20	n.d.	yes	13	13	yes	15	37	yes	5	5	n.d.	77	77	n.d.
Katikutana	1985	361	70	137	176	70	90	n.d.	12	n.d.	yes	13	29	yes	14	47	yes	2	2	n.d.	8	8	n.d.
Praibokul	1986	312	71	142	163	71	98	n.d.	12	n.d.	yes	5	18	yes	3	5	yes	0	0	n.d.	7	7	n.d.
Wanggameti	1987	91	63	68	68	63	67	n.d.	9	n.d.	yes	22	22	yes	13	13	yes	7	7	n.d.	8	8	n.d.
Kananggar	1987	382	46	90	97	46	68	n.d.	28	n.d.	yes	20	22	no	1	9	no	0	0	n.d.	3	3	n.d.
Kmbtabundung	1987	372	64	88	125	64	64	n.d.	20	n.d.	yes	9	23	yes	7	21	yes	1	1	n.d.	7	7	n.d.
Janggamangu	1988	163	48	108	95	48	81	n.d.	17	n.d.	yes	48	64	yes	2	3	yes	2	2	n.d.	1	1	n.d.
Kamanggih	1991	164	18	38	30	18	30	n.d.	0	n.d.	no	0	0	no	6	6	no	0	0	n.d.	0	0	n.d.
Mehangmata	1992	121	17	62	56	11	30	n.d.	3	n.d.	yes	0	0	yes	0	2	yes	0	0	n.d.	0	0	n.d.
Makamenggit	n.d.	395	60	97	270	49	49	n.d.	25	n.d.	yes	4	50	yes	22	67	yes	10	20	n.d.	16	17	n.d.
Pambotadjara	n.d.	216	36	56	117	20	20	n.d.	9	n.d.	no	7	7	no	8	10	no	6	6	n.d.	2	2	n.d.
Karita	n.d.	276	38	115	69	38	59	n.d.	25	n.d.	yes	2	11	yes	0	3	yes	2	2	n.d.	0	0	n.d.
Mbatakapidu	1992	n.d.	-	21	40	-	21	n.d.	-	n.d.	yes	-	5	yes	-	8	yes	-	0	n.d.	-	0	n.d.
Pulupanjang	1992	n.d.	-	55	76	-	26	n.d.	-	n.d.	yes	-	3	yes	-	7	yes	-	0	n.d.	-	0	n.d.
Mahubokul	1992	162	-	21	41	-	21	n.d.	-	n.d.	yes	-	0	yes	-	5	yes	-	0	n.d.	-	0	n.d.
Lailunggi *	n.d.	285	-	66	267	-	25	n.d.	-	n.d.	no	-	0	no	-	0	no	-	0	n.d.	-	0	n.d.
Tarimbang	1992	n.d.	-	17	19	-	17	n.d.	-	n.d.	yes	-	0	yes	-	2	yes	-	0	n.d.	-	0	n.d.
Billa	1993	n.d.	-	-	80	-	-	n.d.	-	n.d.	no	-	-	no	-	-	no	-	-	n.d.	-	-	n.d.
Praimbana	1993	154	-	-	40	-	-	n.d.	-	n.d.	no	-	-	no	-	-	no	-	-	n.d.	-	-	n.d.
Paberamanera	1993	156	-	-	40	-	-	n.d.	-	n.d.	no	-	-	no	-	-	no	-	-	n.d.	-	-	n.d.
Patamawai	1993	182	-	-	12	-	-	n.d.	-	n.d.	no	-	-	no	-	-	no	-	-	n.d.	-	-	n.d.
Weenamba	1993	n.d.	-	-	95	-	-	n.d.	-	n.d.	yes	-	-	yes	-	-	no	-	-	n.d.	-	-	n.d.
Tawui	n.d.	219	-	-	72	-	-	n.d.	-	n.d.	no	-	-	no	-	-	no	-	-	n.d.	-	-	n.d.
Kahiri/Prpaha	n.d.	n.d.	-	-	60	-	-	n.d.	-	n.d.	no	-	-	no	-	-	no	-	-	n.d.	-	-	n.d.
Katikuluku *	n.d.	189	-	-	72	-	-	n.d.	-	n.d.	no	-	-	no	-	-	no	-	-	n.d.	-	-	n.d.
Lumba kore **	n.d.	n.d.	6	-	41	-	-	n.d.	-	n.d.	no	-	-	no	-	-	no	-	-	n.d.	-	-	n.d.
Kondamara **	n.d.	n.d.	22	-	5	-	-	n.d.	-	n.d.	no	-	-	no	-	-	no	-	-	n.d.	-	-	n.d.
Hanggaroru	n.d.	n.d.	-	-	5	-	-	n.d.	-	n.d.	no	-	-	no	-	-	no	-	-	n.d.	-	-	n.d.

Notes: A change in reporting style between the 1991/92 and 1992/93 annual reports meant that total numbers of households to have adopted a particular technology were omitted from the more recent report. Data were only provided on those who were actively planting more trees be they households who had planted in the past or were newly planting that year. Consequently figures for 1992/93 are the result of adding new followers of a technology to the existing followers from 1991/92.

:'n.d.' = no data, strangely there was no village level data supplied on the popularity of terracing in the 1993/94 report.

:The 1993/94 report also did not specify number of households following a particular activity, consequently it was only possible to determine whether a village had some individuals undertaking a particular activity or not, but not their quantity. Therefore, 'yes' in the table indicates that there were some people undertaking that activity in the village, and 'no' indicates that there were no farmers engaging in that activity for that year, although there may be households which have engaged in it in previous years if the figures for 1991-1993 suggest that this is the case.

:* = villages that followed YTN in the past, then ceased all activities only to resume again recently, ** = villages that in the past were only serviced with YTN's water supply project.

Source: Yayasan Tananua 1992, 1993, 1994.

households following the programme is very significant. In the eight villages where YTN's programme has been operative for at least five years, an average of 60 percent of all farmers in each village are following the programme.

In relation to the popularity of individual technologies promoted by YTN, Table 5.1 shows that the absolute number of farmers attracted to making terraces planted with tree legume hedgerows dominates over those undertaking any other single activity. This is the case in villages which have followed the programme for more than five years and in those which have become involved recently. Nevertheless, although in most villages the absolute number of farmers planting horticultural, estate and forest trees is still significantly less than those making terraces, interest in the planting of estate and forest trees grew in many villages from 1991/92 to 1992/93. The rate of growth was particularly substantial in a number of villages serviced by the programme for more than five years, such as Katikuwai where farmers have become more attracted to forest trees, Praibokul where there has been attraction to estate trees and Katikutana and Kambatabundung where there has been an increase in the planting of both of these tree types.

5.3 Analysis of the degree of participation in YTN's approach

5.3.1 Recipient participation in programme planning and conception

Assessments were made of farmers' perceptions of their priority needs and desires to see if those perceptions were consistent with the services provided by YTN's programme. The ability of the programme to meet farmers' priority needs would reflect their participation in its conception and planning. It was necessary to examine farmers' perceptions of needs in non-recipient villages as well as recipient ones because it could be that farmers' thoughts in the latter had been influenced by YTN extension.

In a survey of around 15 percent of farmers in non-YTN and YTN villages, 98 percent in the former said that they saw a need to plant more trees and 88 percent in the latter saw a similar need. In recipient villages those farmers who did not want to plant trees were almost all located in the forest zone. They did not see a need to plant trees because they suspected that they would not be permitted to reside there in the long term. Similarly, in non-YTN villages 98 percent of farmers said that they thought they had enough or plenty of land in their existing holdings to plant trees, 83 percent of those in YTN villages said the same thing. Therefore, most farmers saw a need to plant trees and did not see land as a constraint to doing so. In this sense YTN's emphasis on tree-planting technologies was consistent with farmer perceptions.

Tables 5.2 and 5.3 however, indicate that farmers' preferred tree types are horticultural and estate trees.[1] This seems to be inconsistent with YTN's initial promotion of tree legumes when the programme was conceived in 1982 and their continued popularity until the present. It could be argued that farmers in non-YTN villages do not want tree legumes because they have not seen them before and those in YTN villages do not want them because they already have them. Table 5.4 however, shows that even where farmers know of tree legumes and have not yet planted them, they still much prefer horticultural and estate trees.

Table 5.2 - Farmers most preferred tree type in non-YTN villages
(Values are % of respondent households)

Tree Type	Village		Average
	Praimbana	Meorumba	
Horticultural and estate trees	53.3	83.9	**68.9**
Trees for timber	13.3	0	**6.6**
Tree legumes	16.6	6.5	**11.5**
No preference	13.3	9.7	**11.5**
Wants none	3.3	0	**1.6**
	99.8	100.1	100.1
No. of respondent households	30	31	61

[1] This observation has also been made by Pellokila *et al* (1991: 123). They say that horticultural crops are gaining prominence throughout Nusa Tenggara Timur as its economy becomes progressively more commercialised.

Table 5.3 - Farmers most preferred tree type in YTN villages
(Values are % of respondent households)

Tree Type	Village				Average
	Praibokul	Wanggameti	Katikuwai	Katikutana	
Horticultural and estate trees	92	83.3	90	85.2	**87.8**
Trees for timber	0	0	5	0	**1.1**
Tree legumes	0	16.7	0	14.8	**7.8**
No preference	4	0	5	0	**2.2**
Wants none	4	0	0	0	**1.1**
	100	100	100	100	100
No. of respondent households	25	18	20	27	90

Table 5.4 - Most preferred tree type of farmers in non-YTN villages who have seen and/or heard of tree legumes promoted by YTN
(Values are % of respondent households)

Tree Type	Village		Average
	Praimbana	Meorumba	
Horticultural and estate trees	53.9	83.3	**71**
Trees for timber	0	0	**0**
Tree legumes	38.5	11.1	**22.6**
No preference	7.7	5.6	**6.5**
Wants none	0	0	**0**
	100.1	100	100.1
No. of respondent households	13	18	31

The greater desire for tree legumes in Praimbana, as shown in Table 5.4, could be accounted for by the fact that YTN had already given some extension in the village. Other influences in Praimbana included the village government promoting tree legumes as part of the current OPSUS *Pahamu Nduma Luri* (*Operasi Khusus*, or special operation, at the regional level to improve rural livelihoods). None of these influences occurred in the isolated and traditional village of Meorumba.

The above data, showing that farmers prefer horticultural and estate trees, are inconsistent with what was initially promoted by YTN and with what farmers have chosen to select from YTN's range of technologies. Table 5.1 shows that the numbers of tree legume adopters are far greater than those interested in horticultural and estate trees, even though in

villages which have followed for more than five years the number of horticultural, estate and forest tree growers has increased in the last couple of years. This inconsistency between what farmers most desire and what was initially available to them from the programme suggests that they had a lesser role in programme planning and conception.

When asked directly, most farmers also saw a need for trees which could supply construction timber, as shown in Tables 5.5 and 5.6. Many farmers still get timber from the forest and their desire to plant it is not due to a lack of timber from this source but a result of government prohibitions on forest cutting which are already strong and they feel will be strengthened. Farmers' desire for trees of this type is again inconsistent with the programme as initially conceived, suggesting less participation in planning. It is strange that involvement in family forest activities should be substantially less than terracing and the planting of tree legumes, given this significant desire for construction timber.

Table 5.5 - Farmer perceptions regarding the need for construction timber trees in non-YTN villages
(Values are % of respondent households)

	Village		Average
	Praimbana	Meorumba	
Need timber trees	80	90.3	**85.2**
Do not need timber trees	20	9.7	**14.8**
	100	100	100
No. of respondent households	30	31	61

Table 5.6 - Farmer perceptions regarding the need for construction timber trees in YTN villages
(Values are % of respondent households)

	Village				Average
	Praibokul	Wanggameti	Katikuwai	Katikutana	
Need timber trees	84.6	66.7	90.9	20	**67.1**
Do not need timber trees	15.4	33.3	9.1	80	**32.9**
	100	100	100	100	100
No. of resp. households	26	30	11	15	82

Although farmers prefer other sorts of trees and the initial promotion of tree legumes seems to indicate an insensitivity to these desires, it may have been the case that farmers were attracted to them upon hearing extension, perhaps in a consultative process, which suggested that the technology could fulfil their needs. However, Tables 5.7 and 5.8 indicate that the capacity of tree legumes to provide fuelwood was not a factor.

Table 5.7 - Farmer perceptions regarding the need for fuelwood trees in non-YTN villages
(Values are % of respondent households)

	Village		Average
	Praimbana	Meorumba	
Need fuelwood trees	3.3	22.5	**13.1**
Do not need fuelwood trees	96.7	77.4	**86.9**
	100	99.9	100
No. of respondent households	30	31	61

Table 5.8 - Farmer perceptions regarding the need for fuelwood trees in YTN villages
(Values are % of respondent households)

	Village				Average
	Praibokul	Wanggameti	Katikuwai	Katikutana	
Need fuelwood trees	45.5	31	35.7	0	**32**
Do not need fuelwood trees	54.5	70	64.3	100	**68**
	100	101	100	100	100
No. of resp. households	22	29	14	10	75

The vast majority of farmers saw no need to plant trees for extra fuelwood in both YTN and non-YTN study villages. Sixty-eight percent of respondents in YTN villages were current YTN adopters but only five of the seventy-five households to respond to this question actually used those tree legumes for fuelwood. The majority of farmers continue to extract it from the forest. A shortage of fuelwood was not a perceived need of residents in the study villages, and those who had tree legumes did not use them for fuelwood anyway.

Given the functions of tree legumes the only other reasons why farmers would want to plant them would be for livestock fodder or to improve land fertility and increase agricultural yields. With regard to fodder some farmers said that there was a lack of fodder in the

grasslands and others said there was plenty. These differences were due to actual variations in the quality of the grasslands in different locations. In some sites grazing has occurred for centuries and the grasslands have declined in quality. In other more fertile sites *Chromolaena odorata* has shaded out grasses. Nevertheless, despite some farmers seeing a need for fodder this cannot be interpreted as a significant motivation for the planting of tree legumes. If farmers were motivated by the desire for more fodder one would expect the adoption of fodder grasses in Table 5.1 to be more significant, as tree legumes are at most supplementary feed. Not only is the number of grass planters very small but there was no increase in their number, in any villages (except for Makamenggit), from 1991/92 to 1992/93. Moreover, empirical observations revealed very few farmers using legumes in a cut and carry system.

It also appears that farmers do not perceive a need for improvements in agricultural productivity, as evidenced by Tables 5.9 and 5.10. Table 5.9 indicates that farmers perceive plenty of empty land suited to shifting cultivation. Five of the seven respondents who said they lacked adequate land for shifting their dryland fields stated that this was not due to a physical lack of suitable land but due to the extension of forest zones and a consequent lack of *hak milik* (certifiable) land. All farmers agreed that if one farms in the forest zone there is an excess of land. Thus, it is only policy that is squeezing the amount of available land for a few farmers who hear and obey those policies. In terms of fertility, all farmers in those villages with large tracts of forest, or newly cleared forest, believed that the land there was fertile.

Table 5.9 - Farmer perceptions regarding the availability of land suited to shifting dryland fields
(Values are % of respondent households)

	Village					Average
	Meorumba	Praibokul	Wanggameti	Katikuwai	Katikutana	
Plenty	100	88.9	100	78.3	96	**90.8**
Lack of	0	11.1	0	21.7	4	**9.2**
No. of resp. hh.	3	9	16	23	25	76

Table 5.10 - Farmer perceptions regarding the fertility of fields for traditional dryland agriculture
(Values are % of respondent households)

	Village					Average
	Meorumba	Praibokul	Wanggameti	Katikuwai	Katikutana	
Fertile	60	66.7	100	100	100	**90.3**
Infertile	40	33.3	0	0	0	**9.7**
No. of resp. hh.	15	3	10	17	27	72

The above tables provide strong evidence to suggest that the initial promotion of tree legumes and terracing was not the most consistent technology with farmers' perceived needs and desires. Of course, it cannot be doubted that terracing and the planting of legume hedgerows are very suited to improving the prevailing environmental conditions of Sumba's uplands. They act to prevent the significant problem of erosion and in agricultural terms provide essential nitrogen to Sumba's predominantly alkaline soils. The assessment here however, is of farmer participation in the selection of the programme's predominant technology. If farmers had been involved in planning and conception of the programme one would expect, given the assessment of their desires and needs above, that they would influence the programme so that it initially gave greater emphasis to horticultural and estate trees. One would also expect that individual farmers would be more inclined to adopt the available horticultural and estate tree technologies rather than the tree legume technology as they have done.

Qualitative data provides a deeper insight, suggesting that many needs and problems perceived by the residents of Paberiwai are not met by the programme. The people of Paberiwai are primarily farmers and so agricultural problems are important to them. All forms of agriculture are afflicted by seasonal strong winds (which in January 1993 destroyed around 90 percent of the corn crop in most communities of the study villages), mice plagues, inconsistent rainfall and aridity, plant diseases and a lack of labour and implements. In particular locations, farmers also have significant problems with wild boar and wandering livestock. Farmers with wet rice, in addition to the above problems, suffer from a lack of draftpower and have no specialised implements.

Promotion of tree legume terraces does not directly assist and yet does not worsen any of these problems, except farmers' largest burden, their lack of labour.[2] Demands on labour in Sumba are well illustrated by farmers at Mahambala, in Praibokul. In the wet season of 1992/93 individual farmers tilled, planted and tended five different fields at different times over the season and harvested just one crop. In early November ordinary farmers planted corn and from this they received a reasonable yield. Their second corn crop failed due to the strong winds and their third crop was too late and died when the rains stopped early. To get buffalo to prepare their wet rice they had to help the owner of the buffalo prepare his fields first and then, having prepared their own fields (the fifth task), their wet rice also died from aridity.

Throughout Paberiwai farmers' labour shortages are worsened by the need to protect their fields from wild boar at night and the need to herd and supervise any large livestock they possess, during the day. These livestock must be prevented from straying into the gardens of others and protected from theft.[3] Labour shortages are also compounded by the occurrence of *bulan bakti* (service month) in the middle of the production season in March. During this month all village residents throughout Indonesia are required to engage in work programmes that develop some aspect of their village's infrastructure. Typical activities include the construction of roads, bridges, simple irrigation works and drainage ditches. For the people of NTT the occurrence of this month during the short wet season (it is standard throughout the nation regardless of seasonal variations) is a considerable inconvenience. The actual work done and the number of days in the month that individual householders must spend working on a project is determined by local leaders. This means in some villages the burden is insignificant. In others however, farmers must devote considerable time. Farmers in Praimbana for example,

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[2] Labour shortages amongst shifting cultivators in NTT have also been identified by outsiders such as Ayre-Smith (1991: 89) who noticed that men, women and children were overworked during the food crop production season from November to April or May, and by Pellokila *et al* (1991: 121) who observed that farmers lacked labour for land preparation and weeding in particular.

[3] Theft of large livestock is a major concern to people throughout Paberiwai. In one of the worst locations, at Laingira in Katikuwai, farmers say they had 70 head stolen in one year by people from the lowland kingdom of Karera. It is asserted that the thieves lead the livestock over the mountains to the lowlands where they deposit them on Nggongi's large ranches making it impossible for stolen head to be identified.

considered their activities for the month very burdensome and felt that it greatly interfered with the preparation of their wet rice which they usually complete between February and April.

Farmers' lack of available labour means that the tree legume on terrace technology is less suited to their condition because maintenance of the hedgerows and terraces (which in theory have drains) is a labour intensive activity. YTN extension emphasises the value of tree legume clippings as mulch and green manure but this means that the trees must be continuously pruned and ideally the clippings mixed with the soil. Therefore, although tree legumes reduce the difficulty of weeding, they create new and substantial labour burdens for farmers, if those farmers wish to achieve a level of fertility comparable to shifting cultivation.

Another problem expressed by farmers related to marketing and transport infrastructure. Actual problems experienced by farmers are location specific but farmers in all locations express some kind of problem in relation to these matters. Farmers of Meorumba and Katikutana do not have markets in their own villages and have no vehicular roads traversing their villages. This significantly constrains the amount of produce they can sell and deters them from selling most tree products and vegetables because the difficulty of carrying these heavy goods is not justified by the price received. The only tree products sold are those that can be dried and have high prices, such as areca nut (*Areca catechu*) and candlenut (*Aleurites moluccana*).

Farmers of Praimbana had no such problems as they were on the main road to the large market of Mellolo. They were hindered however, by local regulations saying that farmers could only attend market once a week. With the available transportation, this meant farmers had just three hours at the market per week to sell their goods and buy necessities. Not only did farmers feel this an inordinately short time but it was leading to their exploitation by purchasers. Buyers would wait until shortly before farmers had to return to their villages to buy goods from them because at that time farmers were forced to drop their prices or else pay for their produce to be transported back to Praimbana.

Even in villages with good access to markets, such as Praibokul (which has the largest market in the district at Tana Rara) and Katikuwai (which has a local market and good access by truck to Tana Rara), farmers still experience problems. Most farmers get low prices for their goods because everybody sells immediately at harvest time when the product is abundant. Furthermore, as most markets are local and all local people are farmers, buyers tend to already have plenty of what is being sold. The only products purchased by people from outside of Paberiwai are livestock, candlenut and forest products. Local products which locals themselves can never get enough of are the areca nut and the fruit of the betel vine, in Sumbanese *kuta* (*Piper betle*). Farmers find it very difficult to sell fruit and vegetables as there is little demand, they are heavy and they rot quickly.

A further problem experienced by farmers with local markets in their villages is the occasional dominance of those markets by Chinese merchants. They say that it is not uncommon for the Chinese to come to the market in the early morning and purchase all of the available *kuta* at a price of Rp 500 per *ikat* (7-8 fruits). They then sell the *kuta* at a price of Rp 700 per *ikat* at the same market into the afternoon to the locals. It was even said that those farmers who sold the *kuta* to the Chinese in the morning occasionally have to buy it back at the higher price in the afternoon because their own supply has run out!

Therefore, farmers express the need for marketing assistance: they find this activity equally as difficult as, or perhaps more difficult than, production. At present the state run marketing organisation, KUD (*Koperasi Unit Desa*) is not operative in Paberiwai and there are doubts over its value even if it is established. In other parts of East Nusa Tenggara, such as West Timor, farmers find KUD unattractive. This is partly due to its basic policy of taking goods from farmers and not paying them for those goods until after they are sold. Farmers do not trust this method and find it inconvenient. They prefer to sell cheaply to merchants who give them cash at the moment goods are transferred.

Although farmers feel strongly about the above problems, YTN's programme does not aim to assist farmers in their marketing endeavours. Instead, it focusses on improving their economic position by providing a diverse range of goods which strengthen their subsistence. This may be a more pragmatic purpose because improving transport infrastructure is expensive and does not fit with the principle of self reliance. Similarly, attending to marketing problems may be seen as meddling in an area where the state already has an agency to deal with such matters. Even though KUD is not operating, marketing is its realm and the Indonesian state urges NGOs to operate in areas that are not already serviced by government agencies to avoid conflict and duplication. The issue is however, whether YTN took into account the strength of farmer feelings about marketing which would indicate farmer participation in programme planning. There is no evidence of anything dealing with marketing in the programme. Although unable to operate marketing initiatives on the ground it may have been possible to deal with this need of farmers by lobbying government agencies and policy makers.

Attempts were also made to gauge the perceived needs of women to compare them with services provided by YTN. This could give some indication of their involvement in programme planning and conception. In general the needs of women do not differ substantially from those of men. They work together with men in agriculture and experience similar problems when undertaking this activity.[4] From an outsider's viewpoint however, Sumbanese women do appear to be more disadvantaged than men. This does not relate so much to physical activities undertaken by them but to their position in the society and the freedom that they have over their lives.

Sumbanese women for example, have no choice in the selection of their husbands. The matter is determined by their parents who negotiate with suitors to settle on a brideprice made up of large livestock. Brideprices are often paid for women during their childhood or even at birth. During their married lives women are allowed few freedoms of travel. It is unseemly for

[4] BAPPEDA and Lynch (1988: 9), although acknowledging that the status and role of women needs particular attention, support the observation that both sexes have fairly equal status in agricultural production activities.

them to venture far from the home. This means that in the dry season when their husbands travel to market, visit family to request food, go hunting, search for forest products or discuss village and traditional matters (*urus adat*), they are often left at home to guard their children and slowly clear their surrounding dryland fields by themselves. Upon the death of her husband, a woman is transferred to his younger brother or in the absence of a younger brother to a younger male relative. If the younger male relative is already married she may become his second, third or fourth wife or alternatively the male relative may choose not to accept her and pass her down to another. If no male relatives wish to take her as a wife she remains unmarried but bound to the family. If somebody from outside the family wants to marry her or if her own family wishes to take her back, they must repay to the husband's family the brideprice that was initially paid. This is often prohibitive, particularly if she has aged, and is only allowed if the husband agreed to her being released from the family before his death. A woman is also disadvantaged upon the death of her husband because none of his possessions transfer to her; instead they go to his male relatives. Cattle which she may have tended and fertile land which she has worked become the property of younger male relatives. Widowed women are compelled to look after their own gardens often in less fertile locations by themselves in order to get enough food to care for their children. Thus, it appears that women in Sumbanese society remain chattels of their husbands and have little control over their lives.

It is possible, however, that Sumbanese women do not perceive any problem with the situation outlined above nor a need for it to be changed. Nevertheless, anecdotal evidence from individual women did indicate that some at least were dissatisified with their positions. A young woman at Mahambala in Praibokul said that she had tried to run away from her husband on two occasions because she did not want to marry him but had to as his family paid her brideprice. On both occasions she was returned to her husband by her own family who feared that if she did not return they would have to pay back the brideprice. On the first occasion she made it to the regional capital of Waingapu before her parents came to get her. On the second she was spotted by her parents while she was sitting on a truck waiting to leave the village. She said that when she had finished her second year of Junior High School she had to cease

her education because her husband had requested that he marry her at that stage. Another story from Wanggameti told of a woman who committed suicide at eighteen years of age after enduring five unhappy years of marriage as the second wife of a forty year old man.

Women also express dissatisfaction with their lack of freedom in being unable to leave their houses. Two women in Meorumba said that they did not know if there were trees in other areas which were attractive because they never travel. They complained that men are the only ones to travel and women are the same as, "Poles in the house" (*tiang di rumah*), they hold it up and never leave it. Finally, women themselves express great dissatisfaction with the manner in which they transfer to their husbands' younger male relatives upon his death. In Prokut, Praimbana, a sixty year old farmer returned to the village after a five year absence in order to move into the house and take up the possessions of his deceased brother. The youngest wife did not want to transfer and ran to live with her family in Melolo. The old farmer chased after her however, and her family surrendered her in accordance with tradition. A woman in Laironja, at Wanggameti, said that transferring to a husband's younger relative was all right if he was a good man but if he was not she said that, "We are like slaves in his house, dogs, we are tied to him and cannot get away". She said that her father was a good man who worked hard to till his land and tend his livestock; however, he died. This meant her mother and her father's possessions transferred to her uncle. She said that her uncle was lazy and did not work his fields, he had three wives and many children and when he received her father's cattle he sold them all to buy food of which her mother received very little. Her mother as the fourth and lowest priority wife received no real support from her new husband, she now lives in a garden house by herself tending her fields which she works alone to meet her daily needs. As she is formally still married she is not her own household head and so is not included in censuses and does not receive government assistance from the village subsidy programme. Therefore, the above opinions illustrate that Sumbanese women do think about and rue their condition but feel powerless to do anything. It is not the case that they do not think about their situation and accept it because they know nothing else.

With regard to the manner in which YTN's programme deals with women's needs, it is evident that, as women have similar roles in agricultural production to men, the ineffectiveness of terracing and tree legumes to deal with the major perceived agricultural problems applies equally to them as it does to males. In relation to specific tasks performed by women such as fuelwood and water collection, it would appear (from an outsider's perspective) that YTN's initial programme which emphasised tree legume planting and water supply would ease these laborious tasks. However, as indicated above, although in some locations farmers said that it was difficult to extract fuelwood (such as in the denuded uplands of Praibokul) the majority of households in the study villages, which included women, did not see fuelwood as a need. Most could still extract it with little difficulty from the forest. In particular locations, such as on Wanggameti's uplands and Katikuwai's ridges, women said that collecting water was very arduous and they saw that as their major need. YTN's initial provision of water supply to some villages, although not to the two mentioned above, may have indicated an awareness of this problem; unfortunately this aspect of the programme has been reduced, perhaps as stated earlier for reasons of principle and availability of resources.

YTN's programme makes little contribution to the improvement of womens' social position. It focusses upon physical rather than cultural conditions. This suggests a lack of awareness of womens' issues and their minimal participation in programme conception and planning. YTN's hierarchy has acknowledged womens' lack of participation in the past, not only in planning but in activities through which they could contribute to monitoring and evaluation. For example, YTN's programme coordinator (in World Neighbours 1991: 15) has said that womens' participation in quarterly farmers' meetings has been seriously limited because of the demands made upon them to cook for the substantial number of guests who attend these gatherings. One of the reasons for holding two consecutive quarterly meetings in two different locations and dividing participants amongst these two sites, according to their village of origin, was so the burden upon women would be reduced, thereby allowing them to take more active roles in meetings. Unfortunately, this alteration has not always facilitated greater womens' participation. At the September 1993 meeting at Pinduwatu, Katikutana, which was a meeting

for those from villages located in the eastern division of East Sumba only, the greatest number of women in the hall at any one time was three. This was from a total of forty-four participants. These three included one YTN cadre, one staff member from Flores and a guest from Australia. When the cadre left the meeting early and the staff member fell ill there was just the guest. No local women participated in the meeting let alone ones from other villages. With the one hundred percent increase in the number of villages following YTN in the last two years (not to mention expansion within existing villages) it would be likely that the demands of the two quarterly meetings now held, would be no different from the burden of the single quarterly meeting held at the one location in the past.

YTN has undertaken other initiatives illustrating its desire to increase female participation. In a few villages there have recently been some attempts to organise womens' groups which both conduct activities and provide avenues through which women can express themselves. Furthermore, in the past, the organisation has actively sought to recruit women extensionists in the hope that they could facilitate greater female involvement. Unfortunately, this last initiative has not achieved the desired aim. It was observed that hiring women did not necessarily lead to greater involvement of women because many female extensionists continued to work mainly with males (World Neighbours 1991: 11). YTN has also had trouble retaining female extensionists because of what has been formally described as, "...a rapid turnover due to marriage and/or pregnancy" (World Neighbours 1991: 11).[5]

Therefore, while YTN is aware of the need to engage female participation and has undertaken a number of initiatives to facilitate this at the organisational level, it has so far found it very difficult to achieve a meaningful level of participation. Moreover, from the reality of YTN's meetings, distant from the organisation's discourse, it is evident that womens' participation has been further constrained by male bias overflowing into these fora from Sumbanese culture. Not only has YTN been unable to assess womens' major needs (such as

[5] Appendix C contains an informal version giving a more detailed account of this situation. It provides an alternative perspective to the treatment of women within the organisation and suggests that it has a male bias.

emancipation) and develop activities relating to them, but they are actually conducting some of their procedures in a manner that compounds womens' problems.

YTN's quarterly meeting at Pinduwatu, in addition to being poorly attended by women, was characterised by a predominant attitude of male followers and staff which reinforced dominant sterotypes and showed no concern for womens' thoughts and issues. At this three day meeting nobody had questioned or commented on the fact that the meeting had been poorly attended by women and that moves needed to be taken to correct the situation, until the female guest from Australia raised the matter in her final statement to the meeting five minutes before its conclusion. The male participants had however, sung many love songs to the women in the kitchens over the public address system during meeting breaks. These songs had the common theme of taking the people in the kitchens back to their villages by force and thus reinforced the concept of women as property. Women were referred to by the meeting's moderator as "*pelayan*" (servants) and at the end of the meeting a song was sung by a YTN staff member which brought rapturous laughter and applause from male followers. The song described a young woman who used her beauty to earn money from prostitution; it went on to say that later when she fell pregnant as a consequence of this action, she would no longer be attractive to anyone. It is said that the song is traditional and intended to provide a warning to young women. The only women in the hall however, said that they were embarrassed by the song and it prompted laughter from the male recipients rather than sombre looks.

The existence of male bias in the actuality of YTN meetings was also expressed by a female YTN staff member. This tertiary graduate said that as a woman she found it very hard to express herself in the meeting environment. She said this was because what she says is rarely supported. If Sumbanese agree with a speaker they generally say "*Yama*" ("Yes that's right") while the speaker continues. This encourages the speaker to go on and elaborate as everybody is interested in what is being said. In traditional ceremonies priests and cultural leaders have specialised 'yes men' to support their statements. This female staff member said that when she speaks everybody is silent and this detracts from her point of view. Such is her perception of

the extent of male bias in the organisation, she was concerned YTN would become a "*Lembaga laki-laki*" (that is, a male organisation or perhaps more aptly, a 'boys club').

Two conclusions can be drawn from the above observations. First, and most important for this discussion, it appears that there are numerous gaps between the perceived needs, problems and desires of farmers, and the services provided by YTN's programme. YTN's initial and continued promotion of the tree legume and terrace technology is not consistent with farmers' priorities. This suggests there was little recipient participation in programme conception and planning because the initial project reflected few of the priorities of ordinary Sumbanese, both male and female. It must be reiterated however, that in drawing this conclusion the technology's efficacy is not being doubted. It may well be a highly effective technology which can improve Sumba's agricultural system and environment. Second, despite inconsistencies between the programme and farmer desires, farmers have not followed that part of the programme with most relevance for their situation and priorities. Instead they are embracing the component with the least relevance. The planting of horticultural, estate and forest trees has until very recently been far less popular than the making of terraces planted with tree legumes. This is even though farmers say that they lack labour, see no problem with soil fertility and have plenty of suitable land to shift gardens. Perhaps it was the case that farmers did not realise the value of tree legumes on terraces until after they had heard convincing extension from YTN, or seen the trees close up. The following material as well as further defining the level of participation in YTN's programme attempts to clarify reasons why farmers have given preference to the adoption of terracing and tree legumes. This clarification is essential because it seems that the underlying reasons for the preference towards tree legumes and terracing are responsible for constraining the achievement of participation.

5.3.2 The nature of farmer requests for the YTN technology

The nature of farmers' requests to YTN for the technology they adopted suggests that not only did the majority of ordinary farmers have little participation in planning the programme, they also had little say as to whether they wanted it in their village. WN/YTN principles suggest that farmers must decide for themselves whether they want the technology and there must be no form of coercion. The nature of farmer requests to YTN however, suggests that they were merely reacting to YTN extension when adopting the technology rather than actively seeking the organisation out because of attraction to it. Table 5.11 illustrates that no YTN adopters interviewed had tried planting tree legumes themselves before getting extension from YTN. Table 5.12 indicates that this is even though more than half of YTN adopters had already seen the trees before YTN came to their villages. If farmers were genuinely attracted to these trees then it would be expected that more would have planted them spontaneously.

Table 5.11 - Percentage of YTN adopters who heard YTN extension before planting tree legumes

	Village				Average
	Praibokul	Wanggameti	Katikuwai	Katikutana	
Heard from YTN	100	100	100	100	**100**
Heard from others	0	0	0	0	**0**
Planted without hearing extension	0	0	0	0	**0**
	100	100	100	100	100
No. of resp. households	10	28	26	27	91

Table 5.12 - Percentage of YTN adopters who had seen the tree legume before receiving extension from YTN

	Village				Average
	Praibokul	Wanggameti	Katikuwai	Katikutana	
Seen before extension	50	22.2	66.7	87.5	**50.6**
Never seen before extension	50	77.8	33.3	12.5	**49.4**
	100	100	100	100	100
No. of resp. households	10	36	27	16	89

In relation to the above tables, it may have been the case that having seen the tree legumes farmers reacted by actively seeking out YTN so that they could utilise the organisation's resources and knowledge, rather than trying to plant the trees themselves. However, this possibility is refuted by Table 5.13 indicating that a vast majority of farmers did not seek out YTN personally. In most instances YTN staff merely came to their houses uninvited.

Table 5.13 - Percentage of YTN adopters who requested YTN extension

	Village				Average
	Praibokul	Wanggameti	Katikuwai	Katikutana	
YTN just came, uninvited	40	93.9	65.4	79.2	**76.3**
Local government requested	20	3	15.3	12.5	**10.8**
Farmer requested	20	3	15.3	0	**7.5**
Met without a plan	20	0	3.9	8.3	**5.4**
	100	100	99.9	100	100
No. of resp. households	10	33	26	24	93

The suggestion above that the majority of farmers did not make active requests for the attention of YTN seems to be inconsistent with YTN's methodological approach, as outlined in section 4.2.4. Nevertheless, it is indeed the case that, as YTN's approach operates in practice, most farmers receive attention from the organisation without making requests. For YTN to commence servicing a village with materials and a staff member, it is not necessary for the majority of farmers to make a request. Instead, this initial request may come from just one individual. Thus, in those study villages that YTN did enter as a result of a request (some of the first villages entered by WN/YTN did not make a request but were deliberately selected by the programme organisers) it was observed that this request originated from just one local government official or village leader who was attracted to the programme.[6] Having received the request YTN would come to the village and commence giving extension and materials. Therefore, often individuals merely make requests on behalf of other farmers. Upon arriving in a village, YTN extensionists are not content to establish 'demonstration' gardens, work with pioneer farmers and then wait for other farmers to approach them. Instead, they go to farmers'

[6] And as will be discussed later, often this attraction was not based on their own personal interests in the technologies but was due to other, sometimes political, motivations.

houses and gardens to give extension. Therefore, the initial motivation to follow the tree legume on terrace technology comes only after unrequested extension from YTN. YTN's principle of only servicing those farmers who genuinely want the technology and have significant desire appears to be inconsistent with this practice of giving extension to farmers who have not requested that attention. This is especially the case since it was found that 43 percent of 81 YTN following farmers interviewed said that they actually received tree legume seed during these first uninvited meetings with YTN staff.

The majority of farmers do not participate in either the decision to bring YTN's programme to their village nor in the request for YTN to come to their holdings. It even appears that many farmers do not actively participate in the selection of the initial technology that they adopt from YTN. If farmers are given tree legume seed on a first unrequested visit from YTN then they have had little input in the selection of this technology. This suggests that the higher adoption rates of tree legumes and terracing shown in Table 5.1 occurs (even though this technology is least consistent with farmer desires and needs) because it is a priority of YTN to promote this technology. Table 5.14 further supports the notion that farmers adopt the tree legume on terrace technology because it is a priority of the organisation rather than a desire of their own. The table shows that when extensionists first meet with individual farmers they actively promote tree legumes and terracing only and make no mention of other parts of the programme. YTN staff do not even enquire or discuss with farmers their needs, desires and problems. YTN is not interested in encouraging farmer participation and then tailoring their expertise to individual needs but instead focusses on promoting its programme as a rigid package which in the initial stages always emphasises legumes and terrracing. Therefore, the popularity of terracing in Table 5.1 is the result of this technology getting initial and prominent promotion by YTN staff.

Table 5.14 - What YTN staff discussed in the initial extension
(Values are % of respondent households)

	Village				Average
	Praibokul	Wanggameti	Katikuwai	Katikutana	
Terracing & legumes promote feritility & prevent erosion	100	100	100	100	**100**
Other functions of legumes	0	0	0	0	**0**
Shade trees	0	0	0	0	**0**
Horticulture and estate trees	0	0	0	0	**0**
Your needs	0	0	0	0	**0**
Your problems	0	0	0	0	**0**
	100	100	100	100	100
No. of resp. households	6	7	11	14	38

An alternative explanation as to why farmers have focussed on the adoption of tree legumes and terracing, despite this technology's inconsistency with their priorities, has been offered by WN/YTN (Wodicka pers. comm.). They suggest that high adoption rates of this technology have not been due to it being the organisation's focus of promotion, but are the natural result of the evolution of the programme over time and the varying time of inclusion of each technology in the programme. It is argued that as tree legumes and terracing were the first technology to be introduced in 1982, it would be expected that their adoption rates would be higher than those of estate trees and forest trees, which were not included in the programme until 1986 and 1989 respectively. They say that the rates of adoption of estate and forest trees have increased dramatically in some instances from 1991/92 to 1992/93, thereby implying that the total number of adopters of these technologies would be much higher in the present if they had been included in the programme at an earlier date.

However, an emphasis on the dates of introduction of particular technologies does not overcome the problem of minimal farmer participation in programme planning and conception, nor can it explain the past and continued disproportionate adoption of terracing and tree legumes which is evident from careful examination of the available data. With regard to the first point, the fact that YTN's programme in its initial stages focussed almost solely on the promotion of tree legumes and terracing only serves to reinforce the notion that there must

have been little assessment of farmer needs and desires because of this technology's inconsistency with farmers' perceived priorities. Although there was also a component of the programme selling horticultural trees at this stage, Table 5.14 suggests that this technology received little promotion from the organisation. Nevertheless, it is acknowledged that the introduction of estate and forest trees into the programme has made it more consistent with farmer desires than it was, and this may be indicative of farmer participation in monitoring and evaluation (to be discussed in section 5.3.3).

In relation to the second point above, careful examination of available data does not indicate that overwhelming adoption of tree legumes and terracing was merely a result of the earlier introduction of this technology. In contrast, the nature of adoption can only be explained by an active policy of YTN to emphasise this technology, especially amongst new followers of the programme. It is valid to argue, on the face of data contained in Table 5.1, that the study villages and other villages which joined the programme around 1985 would have had higher adoption rates of tree legumes and terraces because that was the only technology available at that stage. However, the dates contained in Table 5.1 refer only to the year that YTN began in each village when there was only a minority of pioneer farmers following the project. If one observes the year in which the majority of farmers with tree legumes first began following YTN's programme by planting those trees, it is evident that they did so at a date when all of the other technologies were available. Table 5.15 shows that 64 percent of farmers in Praibokul, 33 percent in Wanggameti, 55 percent in Katikuwai and 51 percent in Katikutana first followed YTN's programme and planted tree legumes in and after 1989, when they were free to choose from all of YTN's currently available tree-planting technologies. That is, even though half of the farmers in the study villages first followed YTN's programme after 1989, when they could have chosen horticultural, estate or forest trees, they still first adopted tree legumes.

Table 5.15: Year in which farmers with tree legumes first planted those tree legumes and commenced following YTN

(Values are % of respondent households)

Year	Village				Average
	Praibokul	Wanggameti	Katikuwai	Katikutana	
1982	0	5.6	3.5	0	**2.2**
1983	0	0	0	9.7	**3.3**
1984	0	0	0	3.2	**1.1**
1985	0	0	17.2	6.5	**7.6**
1986	0	33.3	0	6.5	**8.7**
1987	35.7	16.7	10.3	12.9	**16.3**
1988	0	11.1	17.2	6.5	**9.8**
1989	14.3	0	13.8	3.2	**7.6**
1990	35.7	11.1	17.2	19.4	**19.6**
1991	7.1	16.7	13.8	19.4	**15.2**
1992	0	5.6	6.9	0	**3.3**
1993	7.1	0	0	12.9	**5.4**
	99.9	100.1	99.9	100.2	**100.1**
No. of resp. h.holds	14	18	29	31	**92**

Similarly, if one observes in Table 5.1 the nature of technology adoption in those villages which commenced following YTN's programme recently, it is apparent that farmers have continued to adopt terracing and tree legumes in preference to other technologies even though the full range of tree-planting technologies has been available for a number of years. For example, of the villages newly following in 1992/93, Mbatakapidu had 21 followers and 21 households involved in terracing with just eight planting estate trees and eight involved in family forest, while Mahubokul also had 21 followers, all of whom were involved in terracing with none planting estate trees and just 5 involved in family forest. Likewise, Tarimbang commenced with seventeen households all of which made terraces with hedgerows, none planted estate trees and just two planted forest trees. Pulupanjang, outside of its water supply activity, had 26 newly following households all of which made terraces, while just 3 planted estate trees and 7 engaged in family forest.

Strangely, YTN's 1993/94 annual report did not give village by village data for terracing like previous reports. However, of the five villages newly following in that year, just one,

Weenamba, had farmers planting estate and horticultural trees (12 households out of a total of 95). The other four villages of Billa, Praimbana, Paberamanera and Patamawai had no farmers nursing or planting forest, estate or horticultural trees. No information is provided as to what activities these farmers were undertaking. However, reports given by farmers at the Pinduwatu quarterly meeting in September 1993 indicate that terracing was a primary activity. The one farmer from Patamawai at this meeting requested, on behalf of his community, 35 kg of calliandra seed and 10 kg of *gamal* seed, indicating that hedgerows were to be a priority in the 1993/94 planting season. Similarly, the farmer who attended from Praimbana was representing his RW (hamlet) where he said everybody was interested in making terraces and therefore, he requested on their behalf calliandra, *gamal* and flemengia seed (the meeting was not attended by representatives from Billa and Paberamanera).

Of other villages newly commencing in the 1990s (when all technologies were available) Kamanggih commenced in 1991 with 18 households all of which made terraces while just six planted forest trees and none planted either horticultural or estate trees. Mehangmata commenced in 1992 and of 17 households 11 had made terraces, three had planted horticultural trees and none had planted either estate or forest trees (YTN annual report 1991/92). In 1992/93 YTN also commenced activities in Sono in Timor Tengah Selatan. Not surprisingly YTN's 1992/93 report indicates that 41 families followed the programme and all of these were helped to make terraces planted with *gamal* and calliandra hedgerows. No mention was made of the adoption of other technologies. In 1993/94 the number of households making terraces grew to 129, while 16 of these households commenced planting horticultural, estate and forest trees.

It is established above that, i) within villages which commenced following YTN before 1989 more than half of recipients planted tree legumes even though they personally began following the programme after 1989 when all technologies were available; and ii), that in villages which newly commenced following the programme in the 1990s there is still disproportionate adoption of tree legumes and minimal interest in other tree types which is

inconsistent with farmer priorities as assessed. These observations support the notion that YTN has an active policy to promote the tree legume and terracing technology, despite farmer desires. This works against the concept of farmer participation in technology selection.

With regard to the boom in the planting of horticultural and forest trees that has been observed in 1992/93, it is argued that this only eventuates because it is the policy of YTN to begin promoting these technologies. It is not because farmers have greater freedom to choose the technologies which they think will fulfil their desires. Those villages where there has been an increase in the planting of horticultural and estate trees are predominantly the ones where YTN has been operative for some time, at least five years. In these villages many farmers have already planted tree legumes and terraces. As these recipients have already adopted the technology emphasised by YTN in the initial stages, they have been granted the right and encouraged to plant other tree types. It appears that farmers must follow a process of adoption as determined by YTN. It remains impossible to bypass the planting of tree legumes and immediately plant horticultural trees. This is observable from those villages where YTN has been operative for just a short time (entered in the last two to three years) where the planting of tree legumes continues to dominate substantially over limited plantings of horticultural, estate and forest trees.

This section has established that not only was there minimal farmer participation in programme conception and planning, farmers also had an insignificant role in bringing the programme to their village and in selecting the technology that they adopted. The programme enters villages as a result of requests made on behalf of the majority of ordinary farmers while technology selection is controlled and limited by the organisation's policy. Despite this absence of participation YTN has encouraged farmers to adopt tree legumes and its programme. This appears to contradict the theory on the necessity for participatory approaches, which asserts that the advantage of participation is that it strengthens the desire of recipients to adopt innovations; without it adoption is supposed to fail. The situation described above suggests that farmers can be encouraged to adopt innovations without particiption in conception, planning

and technology selection. Perhaps participation in programme evaluation and monitoring and subsequent adaptations to the predominant technology have increased farmer interest after the initial adoption.

5.3.3 Recipient participation in programme monitoring and evaluation

As indicated in section 4.2.3 b) the WN/YTN programme has evolved and altered since its inception. Some of these alterations, in particular a re-emphasis on promotion of horticultural trees and the introduction of estate and forest trees, have resulted in the programme becoming more consistent with farmers' perceived needs and desires. This suggests there is some communication between recipients and programme organisers and that Sumbanese farmers have a capacity to alter components of the programme even after its commencement. Evidence of this can be seen in the development of the family forest concept. It is purported that this technology results from YTN's awareness of farmers' actions and hence their desires, in the village of Wanggameti. Apparently organisation staff observed farmers transplanting saplings of trees, such as cinnamon, from the nearby forest to their housegardens. In response to this, YTN supported the activity by introducing new species with similar functions to the forest trees farmers found attractive, giving extension on nursing techniques and telling others in different locations about the concept. This awareness of farmer actions and desires no doubt was facilitated by YTN's approach, particularly the residence of staff members in the field.

These modifications of the programme however, do not give a detailed description of the extent and quality of farmer participation in monitoring and evaluation. It is unclear for example, whether the promotion of estate and forest trees means that the organisation is truly accountable and responsive to farmer desires or whether the changes only occurred because the concept observed appealed to programme organisers, who were in fact under no compulsion to make alterations if they were not consistent with their principles. Although YTN responded to the desires of farmers in Wanggameti, it is possible that farmers have had other

wishes which have not been acted upon. This section provides a more rigorous examination of farmer participation in monitoring and evaluation. It looks at the actual nature of communication between farmers and the organisation that is occurring in those structures YTN has constructed to promote innovation adoption and encourage participation. These include the use of farmer extensionists located in the villages, small group meetings and the large quarterly farmers' meetings. The frequency and freedom with which farmers spoke about problems they had with YTN's programme, together with YTN's responsiveness to all feedback, would give a more complete idea of participation in monitoring and evaluation.

YTN's policy of insisting that extension staff reside in the villages means that the frequency with which YTN adopters meet with YTN staff (including farmer extensionists) is reasonable. As shown in Table 5.16 over half of recipients interviewed in the study villages said that they meet staff often (those in Table 5.16 who had never met with YTN staff usually receive seed and trees from village leaders but are included by YTN as adopters of the programme).

Table 5.16 - Frequency with which YTN followers meet local YTN staff at any location
(Values are % of respondent households)

Frequency	Village				Average
	Praibokul	Wanggameti	Katikuwai	Katikutana	
Never	0	4.6	23.1	7.7	**8.7**
Once	12.5	4.6	23.1	38.5	**21.7**
Twice	0	4.6	0	3.8	**2.9**
Sometimes (3-11 visits/yr)	12.5	4.6	23.1	11.5	**11.5**
Often (12 or more visits/yr)	75	81.8	30.8	38.5	**55.1**
	100	100.2	100.1	100	99.9
No. of resp. households	8	22	13	26	69

Unfortunately, farmer attendance at, and involvement in, quarterly meetings is not nearly as good. This is of concern because, as noted in section 4.2.4, the YTN hierarchy says that the most important monitoring and evaluation occurs at these meetings. Table 5.17 shows

that over three-quarters of YTN-following farmers have never gone to one of these meetings. This significantly detracts from YTN's ability to receive feedback from ordinary farmers.

Table 5.17 - YTN adopters attendance at quarterly farmer meetings
(Values are % of respondent households)

Attendance	Village				Average
	Praibokul	Wanggameti	Katikuwai	Katikutana	
Never	70	79	86.2	68.6	**76.8**
Once in own village	0	13.2	10.3	20	**13.4**
Twice	0	5.3	0	0	**1.8**
Few times (3-5)	20	2.6	0	2.9	**2.7**
Often (more than 5)	10	0	3.4	8.6	**5.4**
	100	100.1	99.9	100.1	100.1
No. of resp. hh.	10	38	29	35	112

Just six respondents make up the 5.4 percent in Table 5.17 who said that they attended meetings often. Of these, three were adopters who had become paid farmer extensionists, two were members of the village elite who had taken up roles as YTN motivators and the other was an ex-cadre who had almost become paid staff. The three respondents who said that they attended a few times were all young males who were active as YTN cadres and openly expressed their desires to become paid YTN staff. It is one of the prerequisites to becoming an extensionist that the candidate has attended at least four of these meetings. It is a problem for YTN's quarterly meetings that there exists a tendency for farmers not to see them as an opportunity to provide feedback and gain experience but as something one must attend if one has aspirations of becoming staff. If one has no such desire or no hope of becoming staff then there is little point attending. As an example of this, a young farmer from Ramuk told how he used to attend quarterly meetings regularly. He had aspired to become a YTN extensionist. Since another farmer was promoted instead of him, he has not followed meetings and has instead concentrated on becoming a *guru injil* (clergyman) with Sumba's Christian Church.

A basic attraction to YTN because of the opportunities it provides via its system of employment was admitted by YTN's programme coordinator. He said that it was one of his

fears that farmers aspired to become extensionists because they perceived that it would increase their personal status rather than because they had a desire to assist others (Sinaga pers. comm.). Indeed, knowledge of the opportunities provided by YTN has even spread to those villages where the organisation is not operating. In Tanabara, Meorumba, a *Kepala Dusun's* son said offhand, without any prompting, that he wanted to get involved in YTN's programme because he had heard that one gets trees and a "*gaji besar*" (big wage). It is understandable that young farmers would be attracted to wages offered by the organisation. There are very few opportunities for people originating from the village level providing the security of waged employment. Opportunities in the regional government are few and entrance into them is highly competitive, with successful candidates usually being educated to senior high school or tertiary level. In the village environment the only opportunities for wage employment are as village head, primary school teacher or clergyman. The entrance of YTN has provided an additional wage earning opportunity to these limited prospects. The attraction is increased by the fact that the wages provided by YTN are comparable to that of government. Farmer extensionists receive an honorarium of Rp 35,000 per month while the position of village head is only rewarded with Rp 27,000. Those upgraded to the position of extension officer can receive from Rp 100,000 to Rp 210,000 per month depending upon their experience, which compares well to regional government counterparts, while the supervisor receives approximately Rp 385,000 per month and the coordinator Rp 465,000 (Yayasan Tananua 1993: 45). The coordinator's wage is equivalent to that of a regional head of a government department.

The dominance of staff and those ambitious to become staff and the relative scarcity of ordinary farmers wishing to express opinions and gain experience was very evident at the September 1993 Pinduwatu meeting. The last day of this meeting was attended by thirty-four people. Thirteen of these participants were YTN staff (including extension officers, farmer extensionists and cadres, who must attend to give their village reports and then travel to Waingapu to receive their wage or stipend which is distributed after quarterly meetings) and six were guests (including four from Flores and two from Australia). This left just fifteen ordinary

farmers. Of these, eight were attending a meeting for the first time and had very little involvement. They were either curious onlookers or people who had been assigned to make a request for their communities. Thus, there were only seven ordinary farmers who had previously attended meetings and six of these were young males who, given what has been said above, may have been motivated by opportunities to become staff. Therefore, the poor attendance and lack of participation of ordinary farmers was disguised by the core of waged extensionists who swelled the forum numerically and dominated its oral output.

Additional reasons why ordinary farmers do not attend quarterly meetings outside of their own villages include the sheer burden of doing so in terms of time and effort. Wanggameti farmers assert that there is no advantage in going to these meetings, only misfortune. They risk their lives travelling on the roads, their families are hungry at home and if they go in search of forest products for four days instead of going to the meeting they get a much better return for their time. Indeed the demands on ordinary farmers are best exemplified by the burdens endured by those farmers attending the meeting in Karita in December 1992. The actual meeting lasted for four days and ran from seven o'clock in the morning until after midnight for three of these days with two one hour breaks. In addition farmers from Paberiwai had to spend one day travelling to Waingapu and then a further day by YTN chartered truck to Karita in Tabundung. It then took another two days to get home. In total, farmers sacrificed eight days at the beginning of the wet season when they should have been preparing their fields. They also suffered from fatigue due to the hours of the meeting and the burdens of travel. Furthermore, they were not reimbursed for the cost of travel to and from Waingapu which was Rp 7,000. With these sorts of experiences it is not surprising that farmers are reluctant to attend meetings.

Although the frequency with which ordinary farmers attend quarterly meetings is not good this may not matter because of the frequency with which staff members meet farmers individually outside of the meeting forum. This may mean that farmers' concerns are represented by staff at quarterly meetings. However, although the frequency with which

recipients meet extensionists is good, there are doubts as to the quality of this communication. Table 5.18 illustrates that when farmers did meet with extensionists in individual circumstances, those extensionists mainly talked about terracing and tree legumes. Staff used these meetings merely as an opportunity to reinforce adherence to and interest in the dominant technology favoured by the programme. Table 5.19 shows the results of what farmers asked YTN about. Information about terracing and tree legumes is not greatly sought by adopters. If meeting with YTN staff they merely use the sessions to make further requests for seed and trees. There is little farmer interest in the background of the programme nor in the direction it is heading. Furthermore, one quarter of farmers interviewed on this matter said that they either did not ask any questions and just listened to what was said or stated that they wanted to talk to extensionists but did not know how to approach them. These two tables suggest therefore, that YTN staff use meetings with adopters merely to continue promotion of a technology externally conceived and favoured by the organisation while farmers are passive throughout, either not expressing themselves or merely using the meetings to request additional materials.

Table 5.18 - What YTN adopters remember YTN staff talking about when they meet

Topic of Discussion	Adopters recalling each topic	
	No. of Respondents	% of Respondents
Terracing and tree legumes	23	**71.9**
Horticultural and estate trees	0	0
Family Forest	0	0
Nursery Techniques	1	3.1
General Tree Maintenance	4	12.5
In-row tillage	0	0
Livestock management	1	3.1
Inspect gardens	2	6.3
Ask us about problems	0	0
Ask us about needs	0	0
They just come, no extension	1	3.1
Total no. of respondent households	32	100

Table 5.19 - What YTN adopters usually ask YTN staff when they meet them

Topic enquired about	Adopters asking each topic	
	No. of Respondents	% of Respondents
Terracing and tree legumes	2	8
Trees suited here	2	8
Tree planting techniques	4	16
Request seed or trees	7	28
Never request trees	3	12
YTN programme	1	4
Do not talk, just listen	3	12
Want to talk to YTN but does not know how to approach them	3	12
Total no. of respondent households	25	100

The quality of communication between farmers and YTN staff is also limited at individual, small group and quarterly meetings by feelings of intimidation experienced by farmers. This intimidation arises from the experience of the Sumbanese with development programmes and from the attitude of YTN staff members (despite the organisation's aims to avoid duress of this type). Intimidation in farmers' individual dealings with staff is best illustrated by the manner in which the former have concealed their desire to burn their terrace gardens. Many recipient farmers interviewed indicated that they would like to slash and burn tree legume gardens before planting food crops there rather than pruning the legumes, leaving the clippings to rot and then tilling the soil. This would save labour and was what they traditionally did in order to make the land fertile (perhaps sterilise it after a period of abandonment and prevent weed growth). They had noticed problems if they did not burn and preferred not to use the fields.[7] Although farmers told this to the researcher they said they never expressed it to YTN staff because they understood YTN principles to strictly prohibit the burning of fields in any circumstance. Thus, YTN says that it encourages open feedback from farmers but farmers feel they cannot give it in relation to all issues.

[7] Although subjecting the earth to erosion and nutrient leaching, Wirawan (1991: 115) has acknowledged that there can be advantages in the use of fire for field preparation. Many of these are similar to the advantages purported by Sumbanese farmers. He says that burning off eases the clearing of land, releases nutrients locked up in the plant biomass and converts litter and humus of low pH to ash of higher pH which encourages nitrogen fixing bacteria to produce more nitrogen.

YTN's actual policy on the burning of tree legumes is unclear. When asked, the programme coordinator said that the organisation allows farmers to engage in *bakar sopan* (orderly burning). This means they are permitted to burn tree legume fields after a period of abandonment so long as they adhere to a recommended routine. This routine demands that farmers heap legume clippings in the middle of terraces, away from hedgerow stumps which are shielded with earth, before setting the field alight. This is supposed to protect the hedgerows from scalding and death. However, YTN's acceptance of burning in these circumstances has not been communicated to farmers. This is because many YTN staff, below the level of coordinator, are unaware of, or unwilling to promote, the principle of *bakar sopan*. Instead, they transfer to farmers a message that burning is not tolerated. At the Pinduwatu quarterly meeting (which was not attended by the above mentioned coordinator) it was strongly recommended that farmers should not burn in any circumstances. An extension officer from the government's Agriculture Department in Flores was invited by YTN to this meeting. He said that legume clippings should be mulched and added to the soil to stop it from splitting. He emphasised that these clippings should never be burnt. Senior YTN extension officers supported their government counterpart by saying that burning was not good and should be avoided. When asked his view on this issue, YTN's supervisor said that burning was not optimal behaviour because it was not consistent with farmers' long term needs. Therefore, despite the coordinator's individual tolerance of *bakar sopan* the organisation as a whole emits a message via the majority of its staff and its meetings that burning is a bad activity. This has meant that farmers have felt compelled to suppress their desire to set their legume fields alight and has often resulted in them deferring the reopening of abandoned legume fields. As farmers believe fields will not be productive and that field preparation is too labour intensive without burning, and because they fear that burning will anger YTN which has iterated clear prohibitions, they feel it safer to do nothing.

There are two reasons why farmers are uncomfortable about expressing their desires to the organisation when those desires appear on the surface to be against organisation principle. First, farmers are constrained in talking openly to YTN personnel about programme matters of

this type because of their historical experience with development programmes (primarily from the state) and their preconceptions as to how one must react to these programmes. Most farmers know little about the formation of YTN and from where it originates. They do know however, that it is a formal organisation and that both its existence and programme have been sanctioned by the state. They know this because otherwise it would not be able to come into their villages. Their only other experiences with formal organisations have been state agencies and all of these agencies and their programmes had to be obeyed without question (for example, in recent times they had to plant trees available from BANGDES under the village subsidy programme, they have had to plant trees under the GEMPAR programme, they have had to plant a new variety of rice under the GORA programme and very recently had to fulfil the requirements of the new OPSUS). As YTN has a formal programme and all formal programmes in the past could not be questioned, farmers do not question YTN's programme either. Therefore, the air of formality and official sanctioning which YTN had to get to be operative in Sumba has constrained genuine and open feedback from farmers.

The attitude of YTN staff themselves is the second reason why farmers have felt uncomfortable expressing desires that they feel are inconsistent with programme principles. Extensionists do not support farmers wishing to undertake activities contrary to organisation principles. Moreover, they are not open to hearing why farmers engage in these activities, instead preferring to utilise encounters with farmers to further promote the accepted programme. Extensionists for example, are often aware of burning, because they see it. They are loath however, to sanction the burning of tree legume gardens and find out why farmers do it and other contra-programme activities. This attitude stems from fear, on the part of extensionists, that to allow these activities or to demonstrate tolerance of them may reduce their prestige (and consequently opportunities in the organisation) if other staff, the supervisor or coordinator discovered this activity. To accept an activity which is against organisation principles but to continue servicing the farmers responsible would in effect be altering the nature of the programme in the particular village and creating a precedent for other farmers that is unacceptable to the YTN hierarchy. This would open the extensionist responsible for the

evolution of the programme in that village to scrutiny and criticism at quarterly meetings. Consequently, if extensionists encounter farmers straying from the accepted programme they do not listen to the reasons behind their actions but merely threaten to exclude them from the programme altogether so that they will no longer be serviced.[8] This releases the extensionist from responsibility for their actions. At quarterly meetings staff who are aware of farmer interest in the burning of their legume fields can then avoid the matter, pretending that it does not exist, or is only conducted by those who are no longer followers and thus not the particular staff member's responsibility.

Therefore, the dominant method of YTN extension does not encourage farmers to speak openly. Extensionists are only happy if farmers are following the programme so that they will have good news to report. If farmers do not want to follow the programme as set then staff cease to service that individual. This means the actions of the individual cannot damage the reputation of the staff member nor the organisation. In this sense the programme is rigid and is insensitive to farmers' desires if those desires are held by the hierarchy to be fundamentally inconsistent with YTN principle.

An example of how YTN's extension approach emphasises promotion of and adherence to the established programme rather than being receptive to farmer input, comes from the behaviour of YTN's programme coordinator. In September 1993 the programme coordinator informally visited the village of Wanggameti. At that stage some terrace gardens planted with tree legumes were unkempt and not maintained for a variety of reasons of which the coordinator was unaware. The programme coordinator was displeased with the condition of these trees and began berating the local clergyman, a member of the village elite. He commenced by saying, "What is happening with those terraces that are unkempt and the ones

[8] The supervisor of YTN said that the organisation does not have a policy of ceasing service to farmers who burn their tree legume fields. However, farmers who have engaged in burning have experienced such exclusion. Although there is no actual policy on burning, extensionists have been able to reduce attention to those who burn under the organisation's policy of providing resources (particularly horticultural, estate and forest trees) to those who have demonstrated an ability to nurture and care for the trees already given to them. Burning has been deemed to demonstrate an inability to manage trees and thus, a justification for reducing the resources given to those who burn.

which have been eaten by cattle while standing." They had in fact been eaten by goats but the clergyman was given no opportunity to respond. The coordinator continued immediately saying, "I am very disappointed (*amat kecewa*) with the condition of terrace gardens here." He then said without pause, "It would be better if you did not have an extension officer here, wouldn't it?" but it was a rhetorical question and he continued, "With or without terraces and Tananua, Wanggameti will survive won't it? The problem here is that there are too many wealthy people and too many cattle which destroy trees, aren't there?". The coordinator had shown his thoughts, anger and disappointment openly and without response from the clergyman. His statement effectively demanded some sort of action to get the programme back on track or else YTN would depart from the village. Entire villages must follow the YTN programme as designed or else YTN will pull out, farmers must follow as predetermined or else they will not be serviced and low level staff members must facilitate the conceived programme or else face damaging criticism. The coordinator in the above example gave the clergyman no opportunity to give reasons why the gardens were unkempt. By the time he was allowed to speak, his response had been influenced by the open emotion of the coordinator. Fearing that he would incite further disappointment, the clergyman's lame response was, "Yes, yes, what can we do, these cattle are a problem, we will try and get people to work these terraces again". The clergyman had been intimidated by the coordinator, as a result the latter had prevented himself from obtaining genuine feedback.

As indicated above YTN staff are wary of reporting contra-programme views at quarterly meetings, even though these views may originate from farmers, because this opens them to criticism and threatens their opportunities in the organisation. This implies there is intimidation in quarterly meetings as well. This intimidation applies to staff and ordinary farmers. Its existence leads to doubts as to the level of participation at these meetings. It is to be expected that ordinary farmers would find quarterly meetings somewhat intimidating, especially if they have not attended before and recall the formality of government meetings. Although YTN principle emphasises informality, farmers continue to worry (in reality unnecessarily) about their proficiency in *Bahasa Indonesia* and the quality of their clothes. Farmer concern however,

extends beyond trivial matters of this type. Farmers say they are intimidated by the probing nature of the questions asked of them after they have presented reports of their activities. They say that questioners interrogate them demanding to know why they failed or finding fault in the way they did things, they probe for inconsistencies with YTN principles and the accepted method of implementing technologies.

It appears that the granting of democracy and encouragement of constructive criticism at quarterly meetings (far more than has been permitted in government meetings) has been misused. As introduced above, staff use freedom of speech not to speak openly about general issues and problems but to criticise, often pettily, the activities of others. They frequently aim to discredit other staff or extensionists by illustrating how that person's activities are inconsistent with YTN principles. This allows them to reduce the prestige of others and increase their own status (and therefore opportunities for promotion). The belief that YTN principles cannot be changed and the use of them to discredit others means that all farmers and staff become increasingly reluctant to challenge these principles even if they have serious problems with them. Those seeking to challenge the organisation's principles are rarely supported because the Sumbanese are inclined to side with those arguing for the status quo (as they represent a strong structure).[9] Moreover, looking for opportunities to increase personal prestige by attacking others is not restricted to conflicts between staff members but is extended to involve ordinary farmers. Activities of ordinary farmers are singled out to discredit the staff member responsible for those farmers. Failings of farmers are necessarily failings of their extensionist. This is an unpleasant and belittling experience for ordinary farmers. It increases their loathing of meetings and reinforces to them that YTN principles and the programme cannot be challenged.

Rather than challenging principles at quarterly meetings most farmers and staff merely try to survive them. This is evident from the benign nature of the reports given by staff members about their respective villages. These reports follow a standard format that never

[9] This dogmatic adherence to YTN principle perhaps emerges from Sumbanese culture rather than being the result of an active policy of the organisation. In Sumbanese culture, when traditional matters are being discussed, the laws of tradition are indisputable and if they are offended fines must be paid.

involves raising matters which would contradict organisation principles. Extensionists report what their targets for the previous quarter had been, demonstrate what they achieved by citing the total number of farmers following each activity, and then relay the community's and their personal plans for the next quarter. If there is a significant gap between what was achieved and what was planned, extensionists cite constraints to have emerged. These constraints never place responsibility on either YTN's programme nor the extensionist. Instead constrained progress is blamed on factors that cannot be controlled such as wandering livestock, the hotness of the sun, rainfall, government, and the culture of farmers which means they do not use their time efficiently and get distracted by the need to make houses and roads.[10] Therefore, the purported 'lively discussion' at meetings is not initiated by individual extensionists bringing up programme challenging matters in their reports but originates from other staff probing for negligible inconsistencies with organisation principles in a bid to increase prestige. The method of survival for ordinary farmers at quarterly meetings is merely to stay away unless they have something positive to report.

YTN's method of consensus in quarterly and staff meetings is also not satisfying its potential as a participatory mechanism. The existence of residual dissatisfaction amongst low level staff members from meeting resolutions suggests that, in reality, consensus is often not achieved. One YTN cadre told how at a 1993 quarterly meeting (not attended by the researcher) it was decided to select a new supervisor. The majority of farmers were split evenly over two senior extension officers. YTN's leaders however, considered neither of these appropriate and so suggested that a third officer be promoted to the position instead. After the leadership had presented its case this third officer was accepted to the position despite the clearly demonstrated desires of most farmers. Another instance was relayed by a female staff member who told how at a closed meeting staff members were discussing wage levels. The two highest ranking staff members argued that, due to the burdens of their positions, they should be awarded a substantial pay increase from the donor agency, which was in relative and

10 Placing primary blame on uncontrollable constraints is also evidenced in YTN documents, see for example Yayasan Tananua (1992: 10).

absolute terms, much greater than that to be requested for other staff. Low level staff members, including this female, disagreed with the disproportionate increase but the provision was nevertheless included in YTN's submission to its donors. Finally, another low level staff member told how he thought that, when the matter was being discussed, YTN should have agreed to accept funds from additional sources. However, as the coordinator did not agree with this notion it was rejected.

The decisions made in the examples above are not at issue here. Of importance is the process that was undertaken in making those decisions. For staff members to complain about these decisions some time after they were made, without prompting, indicates that they were and continue to be immensely dissatisfied. For these resolutions to have been made while some parties remained dissatisfied means they could not have resulted from genuine consensus. It seems they were passed as a result of YTN's leaders' opinions being exerted over the desires of others. This indicates that to a degree the organisation retains a 'top-down' nature and suggests that participation in its decision-making processes is not optimal.

It has been argued above that the actual level of participation in YTN's quarterly meetings is not high. Given the structure of quarterly meetings however, this is to be expected. The strengths of these meetings in promoting farmer interest in the programme and encouraging them to adopt technologies is precisely what constrains participation. In this sense, it is unrealistic for YTN to expect that quarterly meetings can be at the centre of its mechanism for including farmers in monitoring and evaluation.

The notion that it is the strength of quarterly meetings in motivating farmers, that is its weakness in encouraging participation, is supported by the work of Holloway (1984). He told of a nearly identical system of quarterly meetings (entitled 'Kring' meetings) being used in Central Java in the early 1980s. These meetings were similar to those of YTN in that they rotated amongst a number of participant villages and were attended by an average of 40 farmers. The meeting format was also very similar. It involved each follower giving a report of activities in

their home village over the last quarter, tours of the host village to see developments, discussing identified issues of importance, choosing topics of importance for the next meeting and making plans for the next quarter. However, Holloway's reasons why these meetings succeeded in motivating farmers to improve their conditions are clearly contrary to the aim of generating farmer participation that can be used in programme monitoring and evaluation. Holloway (1984: 6) claims that these quarterly meetings were,

> "...a forum into which Government and non-Government agencies can feed their ideas. It acts initially to introduce new ideas, and every subsequent meeting consolidates those ideas... It uses the psychology of peer-group pressure to stimulate concrete activities and reinforces these with peer-group approval."

Therefore, Holloway says that the success of quarterly meetings in getting farmers to adopt ideas from government and non-government agencies can be attributed to peer group pressure and approval. This means the major feeling at these meetings is one of conformity moulded by peer group pressure. In such an environment it is very difficult for participants to express opinions critical of the programme because that will necessarily mean confronting the majority of farmers forming the peer group that is promoting these ideas. In this sense the dominant mechanism of these meetings, while good at encouraging adoption, works against farmers providing genuine feedback, especially contra-programme feedback.[11]

It can be concluded that the real level of participation achieved by YTN is low. There is no evidence that recipient farmers in the Paberiwai region helped in initial technology selection or were involved in programme planning. Many farmers adopted the tree legume on terrace

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[11] Holloway (1984: 6) also observed that the Kring quarterly meetings were, "...not attended by enough women, ...concentrate more on physical projects rather than other kinds such as literacy or credit unions, (and)...concern themselves with projects to develop the whole village rather than the poorest in them." Nevertheless, Holloway concluded that these problems were not structural but rather was just what had happened to date. However, given that YTN's quarterly meetings have experienced near identical problems there are doubts as to the ability of these meetings to deal with the issues of women and the poor. For YTN this similarity of experience may indicate that they need to reduce the emphasis placed on quarterly meetings and focus more on other structures which give specific attention to these groups. Of course for YTN to do this they must prioritise what is more important to them, the promotion of their technologies or identifying and servicing the needs of the most disadvantaged. If past performance is indicative of YTN's priorities it is imagined that they would merely continue to emphasise quarterly meetings.

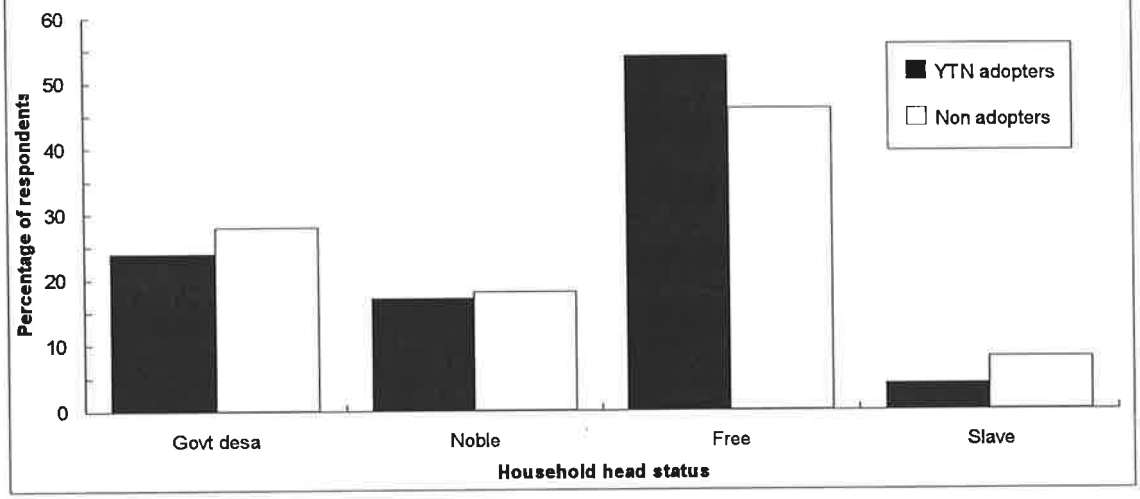
technology because it was the one most actively promoted by the organisation. This was even though they adopted an activity less consistent with their needs and desires. Finally, there is little direct feedback from farmers relating to problems or thoughts that they have about the programme, even though problems exist. Nevertheless, since the programme commenced, some modifications have occurred, consistent with staff observations of farmer desires. To date however, YTN has been highly selective when making modifications. They have been restricted to introducing new technologies that are consistent with the organisation's principles and its focus on increasing agricultural productivity. It has not been prepared to make what it considers radical changes in order to accommodate farmer desires. The programme's principles appear rigid and not prone to adaptation. If farmers' implementation of the programme differs too greatly from the organisation's perceived best practice, then YTN prefers to keep its programme intact by taking it away from those individuals or away from those areas and relocating in new villages. By retaining this level of control YTN has reduced the degree of recipient participation.

5.3.4 Variations in participation amongst different socio-economic groups

Significant participation would encourage involvement from all socio-economic groups but particularly those with the greatest need (poorest). People from these groups should participate as receivers and be actively involved in conceptualisation and feedback if they are to undergo human development. To assess WN/YTN efforts to assist the most needy, comparisons were made at the village level between those villages following YTN and those that were not, to see if particularly needy villages were not being serviced while those with lesser need were. It was however, impossible to differentiate between the needs of Paberiwai villages because there are needy people in every village. Differences within villages are far more significant than those between them. In the absence of significant variation in need between villages the YTN programme locates in those where a local person makes a request.

When choosing where to locate within villages YTN uses the same principle of servicing communities that make requests. YTN does not direct its programme to where the most needy are found but to where the desire from farmers is greatest so that its programme can become established. This has meant that with regard to the reception of YTN technologies there is little variation in the social backgrounds of adopters and non-adopters. As shown in Figure 5.1, in both groups there were similar proportions of people from all three Sumbanese castes (*Maramba* - nobles, *Kabihu* - freemen and *Ata* - slaves) and from village (*desa*) government.

Figure 5.1: Comparison of YTN status to household head status



Notes: From a total of 107 YTN adopting households and 39 non-adopting households in the YTN following study villages.
Households were characterised according to known status, although the boundaries between those of 'slave' and 'free' status are becoming increasingly difficult to differentiate and identify.

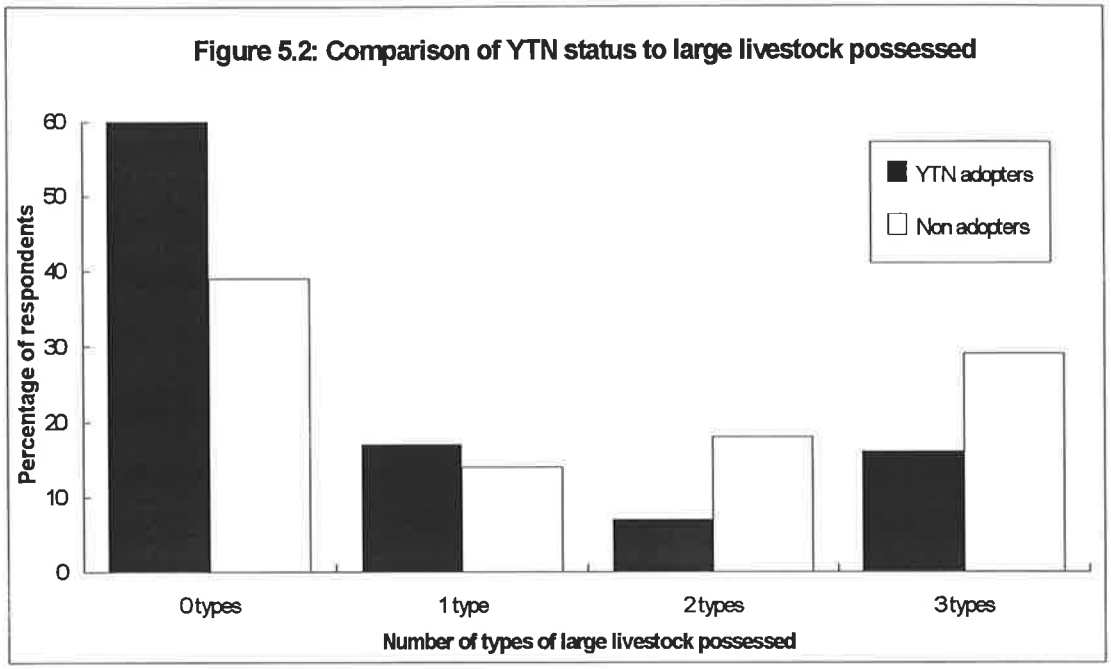
In addition to the reason given above, the tendency of people from all social backgrounds to be represented amongst adopters is assisted by an inclination of YTN staff to intensify extension efforts in one community within a village rather than spreading out to service all communities. Adoption tends to be centred around the home of extensionists amongst farmers of all backgrounds rather than spreading out through the village amongst members of a particular status group.

It is important to clarify that of the three castes identified above, nobles would in general terms be least in need. Similarly, officials of the village government would generally be less needy than both freemen and slaves. However, the comparative positions of freemen and slaves cannot be generalised. On the basis of terminology it would be expected that freemen hold a more advantageous position than slaves, but this is not always the case. Sumbanese of slave status could be referred to as 'retainers'. This is justified by the reciprocal relationship a slave has with the noble who is his or her lord. Slaves are culturally committed to perform many tasks, and are confined to certain roles, for the benefit of their lords. The most burdensome of these tasks is the obligation of slaves to help prepare and maintain their lords' fields. Although they often have their own land, slaves cannot attend this land until work on their lords' is up to date. Slaves also feel compelled to give part of their produce to their lords. This is not an obligation but is done as a sign of gratitude. In terms of freedom, slaves are confined to the role their social position defines. They cannot move up in the social order nor can they move away from the lord who owns them. If they run from their lord, it is common for the lord to track them down and request that they return to his estate. Male slaves reside in the house or on the estate of their lord all of their life. Female slaves may only leave their lord if they marry to other areas. Nevertheless, the labour and sacrifice of slaves is rewarded by their lords. The land slaves work is granted to them by their lord. Lords are obliged to find land for all of their slaves who have married. Similarly, in the same manner that slaves give food to their lord, lords are compelled by tradition to feed their slaves during times of shortage. Lords also pay the brideprice for male slaves who wish to marry and can help slaves raise their children. Due to the reciprocity of this relationship, those slaves with benevolent and wealthy lords are immensely loyal and generate some pride from being the retainer of a powerful noble.

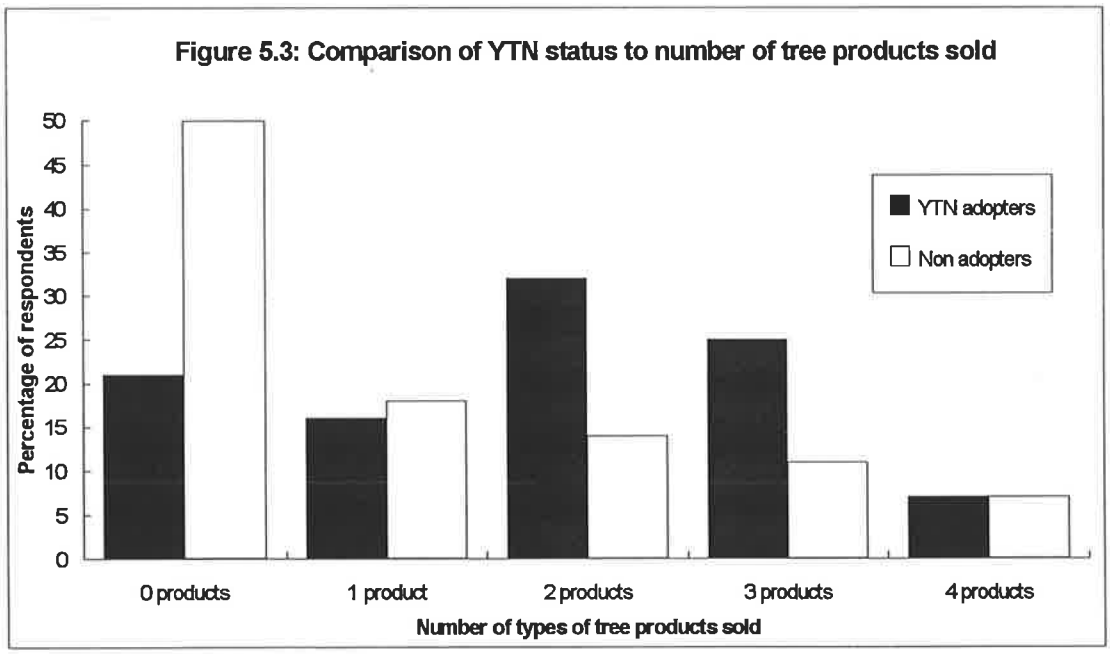
Due to this reciprocity between slaves and lords, it does occur that slaves hold better positions than freemen. Within each of the three Sumbanese castes there are scales of advantage. Hence, slaves of wealthy lords are often better off than freemen of lower status. For example, it was observed that freemen who migrated into the study villages from other areas were worse off than the slaves of powerful lords. Freemen of this type found it difficult to

obtain land and borrow buffalo for wet rice preparation, while slaves were guaranteed access to those resources by their lord. Although freemen are not obliged to work for nobles they often must, in order to borrow buffalo. Having worked for the lord however, there was no guarantee that they would get the buffalo immediately. Often lords prefer to lend buffalo to favoured slaves beforehand because of their closer relationship. In these circumstances slaves are much better off than freemen. On the other hand freemen who originate from an area and are supported by ordinary family connections usually hold similar positions to slaves of wealthy nobles and far superior positions to slaves whose lords are neither wealthy nor powerful. Slaves in the latter circumstance are seriously disadvantaged. They get little assistance from their lords and generate little pride from the relationship. They are often the least respected people in the community. People of slave status in the highly traditional village of Meorumba told how trees and other goods from the village subsidy programme were never distributed to them because of their status. A female slave also described how candlenut saplings that she had planted were dug up and stolen shortly before a government inspection. She said this indicated the lack of respect others in the community had for people of her class.

Returning to the examination of who is involved in YTN's programme, it is evident that, although the social backgrounds of followers are balanced, there are variations in the backgrounds of adopters and non-adopters in relation to their livelihood activities. In general, YTN adopters are less dependent on large livestock and more dependent on tree products. Figures 5.2, 5.3 and 5.4 support this by showing that YTN adopters possess a smaller variety of large livestock (cattle, buffaloes and horses) and sell a greater variety and quantity of tree products. It was also observed in the YTN 'adopting' study villages that, 73 percent of 107 YTN adopting households had dryland fields larger in area than wet rice fields while just 54 percent of 42 non-adopting households were in this position. This suggests that YTN followers were more likely to be dependent upon dryland cultivation.

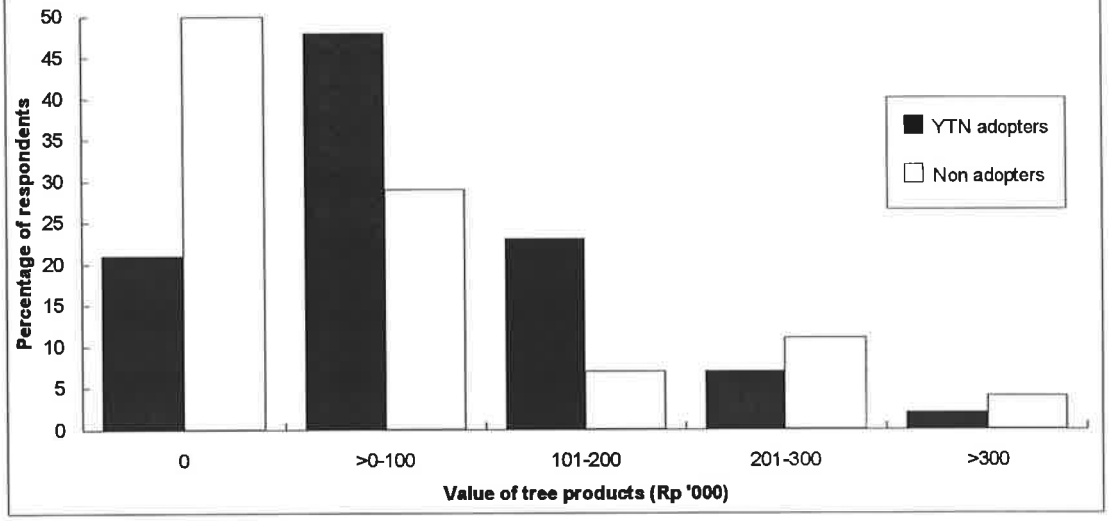


Note: From a total of 107 YTN adopting and 42 non-adopting households in the YTN following study villages.



Note: From a total of 107 YTN adopting and 42 non-adopting households in the YTN following study villages.

Figure 5.4: Comparison of YTN status with value of tree products sold



Note: From a total of 107 YTN adopting and 42 non-adopting households in the YTN following study villages.

Given that YTN's programme focusses on the intensification of dryland agriculture and the planting of tree crops it is logical that people dependent upon these activities for their livelihood would be most attracted. As implied above however, it is not just the case that farmers of this type are more interested in the technology because it is more consistent with their livelihood activities. Instead, YTN actually prefers to service them because the organisation thinks that they will be better adopters (although there are exceptions such as in Pinduwatu, Katikutana, where for unclear reasons WN/YTN chose to enter a wet rice area). Hence, in Katikuwai the YTN farmer extensionist told how he deliberately withheld service from the predominantly pastoral community of Matawaiwatu because he considered that it would be difficult for the programme to succeed there given the propensity of farmers to release their cattle for browsing.

Although there are differences between the livelihood activities of adopters and non-adopters, there are few socio-economic differences. This is because amongst dryland farmers and tree cultivators there are both wealthy and needy farmers just as there are amongst those who concentrate on the management of wet rice and livestock. This notion, that adopters and

non-adopters share a similar socio-economic mix despite their varying livelihood activities, is supported by observations of house type. Of YTN adopters 70 percent lived in houses with grass roofs compared to 68 percent of non-adopters (with the remainder in both groups living in iron roofed houses, except for a negigible number still in traditional houses, *uma marapu*). Similarly, 25 percent of adopters lived in houses with windows compared to 24 percent of non-adopters. As adopters and non-adopters have similar house types this indicates that they can afford similar materials and therefore are of similar wealth, despite their varying livelihoods.

Due to YTN's deliberate method of promotion, its programme has been received relatively equally amongst people of differing social and economic backgrounds. The needy have not been the focus of attention but they have also not been excluded by the involvement of those less in need. Despite this, there were indications that the village elite tended to be slightly favoured by the approach of YTN in the study villages. This advantage stemmed from YTN actively seeking the approval of village leaders when first entering a community, to smooth the programme's path. This meant that, as is shown in Table 5.20, YTN staff spend more time with village leaders and give them more direct extension than they do slaves and freemen.

Table 5.20 - Frequency with which YTN adopters of particular status meet local YTN staff at any location
(Values are % of respondent households)

Frequency	Status of Adopters		
	Slaves and Freemen	Nobles	Government Officials
Never	9.3	0	0
Once	30.2	18.2	13.3
Twice	4.7	0	0
Sometimes (3-11 visits/yr)	9.3	9.1	20
Often (12 or more visits/yr)	46.5	72.7	66.7
	100	100	100
No. of resp. households	43	11	15

Giving more attention and direct extension to the village elite means that they have greater knowledge of and access to the programme. This leads to situations of a kind observed in Laru,

Katikuwai. In that community, local leaders were visited on multiple occasions meaning they had good understanding and first use of the programme. Ordinary farmers rarely met YTN staff and as a result they had delayed joining the organisation. By the time they wanted to join they were disadvantaged because the programme had progressed in their village so that if they wanted horticultural trees they would have to purchase them. When horticultural trees were first introduced into Laru they were free, hence benefiting the village leaders who dominated the total number of YTN followers at that stage.

In terms of reception the equality of involvement in the programme is fairly good. This is due to the nature of YTN extension which intensifies adoption in one particular community, normally around the farmer extensionist's home. YTN does not deliberately attempt to reach the most needy but many needy farmers are serviced because of emphasis on blanket adoption. Needier farmers however, get less attention from YTN which inhibits the extent and speed of their adoption, and further limits their opportunities to provide feedback to the organisation. In effect, needy farmers also have little opportunity of becoming organisation staff. The principle of giving those with good gardens demonstrating YTN principles the opportunity to become staff works against those of needy background. The wealthy tend to have more developed gardens because of the extra extension that they receive. The needy are also disadvantaged because extensionists are supposed to have proven leadership ability, this normally means that existing village leaders are preferred.

5.3.5 Examples of a low level of participation in YTN's approach from Pinduwatu and Pahulubandil

The low level of participation in YTN's approach can be witnessed at two locations where YTN has been operative for some time, Pinduwatu in Desa Katikutana and Pahulubandil in Desa Wanggameti. Pinduwatu's village leaders say when WN/YTN first came to the community in 1985 they came with no invitation from local people. They arrived and arranged a

meeting so that they could address the community. The people of Pinduwatu did not know why they chose to come to them but it just seemed that they were a priority of the NGO. Most influential members of the community attended the meeting to hear what the strangers, including an American, had to say. At this first meeting WN's area leader spoke about terracing reinforced with tree legumes for land conservation and improved soil fertility. At no stage were farmers invited to talk about conditions in their village, their problems or desires. Farmers were also offered no alternative technologies, terracing was the only one described. The few farmers who wished to make terraces were serviced while those not attracted received no attention at all: there was no alternative programme designed to interest them. Farmers had no role in programme planning, the externally conceived programme had to be received as it was, and could not be adapted to the situation of individual farmers.

It is peculiar that the rigid YTN programme which emphasises innovations to assist dryland cultivation should even come to Pinduwatu, given that there was no request from farmers and that Pinduwatu is one of the most productive wet rice regions in all of Paberiwai. It rarely experiences the seasonal famines that afflict other areas. All farmers possess at least a little wet rice with some of the elite having up to three hectares. The area is fed by a natural spring meaning rice can be harvested two to three times a year. Although farmers frequently work together they lack labour to keep up with all of the tasks associated with their wet rice. Most farmers are so busy with their wet rice fields they do not work dryland fields or such fields are very small (around 0.1 of a hectare). Farmers say their major problems are a lack of labour (meaning they cannot cultivate all land suited to wet rice), a lack of draftpower and a shortage of implements for working wet rice. In this sense the labour intensive tree legume technology is unsuited to their situation. Furthermore, the natural spring was already well protected by a fertile areca nut forest garden and most of the terraces were made below the height of the spring. This means that the purpose of the terraces could not have been to preserve the area's water source. Not only did farmers have no role in programme planning, the programme conceived was inconsistent with their needs and predominant activities.

A further problem is that the programme has been inflexible to farmer feedback and not amenable to adaptation. Pinduwatu farmers have realised that tree legumes do have valuable properties. Hence, they are interested in knowing how they could be used to improve the fertility of wet rice gardens. Dryland agriculture is not their primary activity and they acknowledge that tree legumes are being underutilised at present. However, these desires to adapt the given technology to their major activity have received no technical nor moral support from YTN. YTN says that its principles aim at the improvement of dryland agriculture and because of that it is loath to assist in the improvement of wet rice cultivation.[12] At the Pinduwatu quarterly meeting a small group of farmers and an extensionist went on a field visit around the community. At the end of the visit they had to assess what they had seen and make recommendations which would later be relayed to the rest of the meeting by the extensionist. Of the various recommendations derived it was suggested that they use the tree legumes to improve the productivity of wet rice gardens. However, when it came to relaying these observations and recommendations the extensionist omitted the suggestion about integrating tree legumes with wet rice production. He perhaps considered that because YTN had already stressed its preference towards dryland agriculture, his raising of this matter could be interpreted as challenging the programme's principles and lead to unnecessary scrutiny.

The programme's inability to adapt to farmers' prevailing conditions can also be witnessed at Pahulubandil in Desa Wanggameti. YTN did come to Wanggameti as the result of a request. A pair of village leaders from Laironja had tried planting the tree legumes by themselves. They used this as a sign of their interest in the programme and subsequently they requested that the village be given seed and extension. In 1987, on the basis of this request from two individuals, YTN sent an extension officer to live in the village. He then actively

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[12] Others have also observed both the potential of tree legumes to help wet rice production and YTN's reluctance to support this development in Pinduwatu. Stoney (undated: 9) observed that,

> "Efforts to improve soil quality using livestock manure and green manures are badly needed in dryland gardens, but would also be appropriate in irrigated fields where fertilizer is rarely used. Some Tananua staff feel strongly, however, that the program should continue to deal only with dryland methods."

promoted the tree legume on terrace technology amongst the village's other ninety families. As described in section 5.3.2, for the majority, a request was made on their behalf.

Pahulubandil farmers say however, that they have been unable to use their terrace gardens for agriculture because of large livestock (cows and buffaloes) which wander freely in the same uplands where they have their fields. The rigid programme has been unable to respond to these conditions. YTN merely says that if livestock are not controlled and the gardens maintained then the organisation will turn its attention elsewhere. No attempts have been made to encourage farmers to fence these gardens. YTN does promote living fence technologies but at no stage has a suitable one been promoted for the Pahulubandil region. Popular living fence species such as *Gliricidia sepium* and the local *Kehi* (*Lannea grandis*) are infertile in the cold conditions of Pahulubandil. Farmers need assistance in finding a suitable species and in developing a planting strategy that will protect the trees from livestock (especially buffalo) when they are young. Such assistance has not been forthcoming. The programme has instead encouraged farmers to plant tree legumes, make terraces and establish family forests,[13] even though the chances of success are minimal. The wandering livestock problem existed in the Wanggameti uplands since well before YTN came to the region but the programme was not adapted to overcome these conditions when introduced into the village.

5.4 Underlying reason for the lack of participation in YTN's approach

Participation by ordinary recipient farmers in YTN's programme is minimal. Factors contributing to this have already been alluded to. Ordinary farmers are constrained by cultural

[13] Damage to family forests by wandering livestock in Pahulubandil has been particularly disappointing to farmers. One farmer told how he had lost all of his 48 ***albizzia*** and 38 mahogany saplings and 52 of 54 ***johar*** saplings to wandering cattle. He said he was interested in the programme, had attended 5 quarterly meetings, followed a cross visit to East Timor and been identified as a future staff member. However, since his family forest was destroyed his opportunities in the organisation have dissipated together with his interest and he has spent the last three years exploiting forest products. Another potential farmer extensionist who had taken numerous trees from the forest, attended many meetings and gone on cross visits to TTS, TTU and Kupang said that he was no longer active because of damage to his trees by livestock and he had joined the ranks of what he called the many "***anggota putus asa***" of Pahulubandil (dispirited members).

preconceptions of how formal organisations must be related to; they are reluctant to mention problems to extensionists because those extensionists do not want to hear contra-programme statements, which only lead to them threatening to cease service to the complainant. Low level staff hinder genuine participation because it opens them to attack from peers who as a result of their culture and experience with YTN feel that the organisation's principles are unchallengeable. This does not however, explain the underlying reasons for the lack of participation in YTN's approach. It does not explain why YTN has promoted tree legumes and terracing so strongly, it does not explain why high level staff sanction the obvious censure of those who challenge chosen technologies and it does not explain who initially chose the technology if it was not selected by farmers themselves. There is an obvious contradiction between YTN's principle of enhancing participation and its dogged adherence to and promotion of the one technology in preference to others more consistent with farmer desires. This contradiction has its roots in the parent organisation, World Neighbours.

As stated in section 4.2.3 WN began promoting the tree legume on terrace technology in 1982 and this technology, despite minor modifications, has continued to be most popular, consistently being the dominant technology adopted in new villages. This technology has been promoted vigorously despite its inconsistency with farmer desires because of the policies and beliefs of WN. There is evidence suggesting that this technology's implementation in Sumba did not originate from consultation with local Sumbanese people but resulted from WN's preconception that it was the most suited technology. Evidence for this preconception can be found in the work of WN's most renowned writer Bunch. His "Two Ears of Corn", released in 1982, went into great detail of the methodological approach development agencies should use based on the WN experience. He emphasised the use of the participatory approach which YTN also aims to use. This approach included the importance of a programme solving felt needs, the importance of involving locals in programme planning and the freedom of farmers to be creative in their work to generate enthusiasm for the programme (Bunch 1982: 24). In the same work however, Bunch also gave ideas as to possible technologies that could be used to improve rural livelihoods. There is an obvious contradiction on the one hand saying that programmes must be

developed in close consultation at the local level and on the other already having some ideas of promotable technologies. Merely outlining the principles of appropriate technologies would be tolerable but Bunch and WN go further. First, they emphasise the notion of agricultural improvement in their programmes. What happens however, if farmers do not feel a need for agricultural improvement but have other more pressing needs, perhaps political representation or changes in land distribution? Furthermore, they speak excitedly about particular agricultural technologies. Bunch (1982: 39) illustrates his enthusiasm for legume hedgerow intercropping and betrays his principle of waiting to involve recipient farmers in planning by saying that,

> "...recent research has made some very promising breakthroughs in multiple cropping and intercropping that may make hand cultivation in the tropics more productive than we had ever dreamed..."

and, with even more enthusiasm and relevance for what was promoted in Sumba,

> "One technology with tremendous untapped potential is that of using legumes as green manure crops. They can frequently be grown on otherwise idle land, either during fallowing (thereby shortening periods of fallow to a few months), intercropped with traditional crops, or, in the case of highly drought-resistant species, planted among other crops just before the rains end so they can grow through the dry season. Almost always a more appropriate technology than composting, green manure crops are simple to understand and adopt, require almost no capital, use no outside resources, and provide numerous ecological advantages. They can also motivate farmers to stop burning crop residues and to abandon slash-and-burn systems of agriculture" (1982: 124).

Since initial establishment of the programme WN's preconception as to the best technology for the Sumbanese has been inherited and reinforced by YTN. This has led to YTN also inheriting the contradiction which renders ineffectual its intended participatory approach. Although not recognising the contradiction caused by this preconception of the best technology, Djogo *et al* (1992) provide support for its existence. In a paper outlining the approach used by YTN they say that the organisation,

> "...usually come to the villages without any promise nor start with any technology. Field staff always commenced the programme with community approach and an orientation program at the same time they perform an assessment or appraisal to understand the basic need of local people.
> Then a small field trial being conducted at selected farmers (sic). Yayasan always started with very small program involving well committed farmers.
> This organisation usually introduce soil conservation technique with live hedgerows as the beginning of the program." (my emphasis) (1992: 5)

There is an obvious conflict in the above citation between the two emphasised phrases. If YTN does come to each village without a particular technology and derives ideas for suitable technologies from farmer needs then one would not expect them to commence with soil conservation hedgerows in all circumstances as is implied above and apparent from empirical observation. This is especially the case since Sumba and NTT generally, are renowned for great variations in microclimate (Banilodu and Saka 1993: 4). Barlow and Gondowarsito (1991: 21) say that the topography creates rain shadows and hence, significant climatic disparities between closely adjacent sites. They say this necessitates substantial modification to introduced technologies before they can become appropriate to individual locations. The only reason for the inordinate promotion of hedgerows and terracing throughout Sumba's uplands could be the preconception referred to.

The notion that WN and consequently YTN, have allowed their preconception of the best technology to diminish farmer participation is further supported by the fact that WN has promoted this same technology not only throughout Sumba but in different countries also. Fujisaka (1989) described a WN project in Cebu in the Philippines commencing in 1981 which assisted upland farmers to establish contour lines using the A-frame, construct terraces and then plant them with tree legumes and forage grasses. If WN was merely relying on farmers' perceived needs and desires for technology selection it is highly coincidental that identical projects would be developed in these distant locations. There is no coincidence however, as it is apparent that in the early 1980s WN preconceived the best technology for upland regions and then identified these particular locations in Sumba and Cebu so that the technology could

be established and demonstrate its potential. Indeed, it is admitted by WN that their initial purpose was to prove the efficacy of their approach and chosen technology and their selection of sites was designed to facilitate this. Fisher *et al* (1993: 5) confess that they initially selected sites which would allow them to test, prove and hence establish their preconceived best technology, when they say that,

> "During the early 1980s, World Neighbours support was focussed on establishing a few very solid program efforts in several strategic sites, in order to gain direct experience in testing and proving program approaches."

That WN gave priority to the promotion of the preconceived technology over farmer desires and selected areas that would allow the technology to demonstrate its potential and thus enhance its adoption, gains support from the behaviour of YTN which adheres to a similar principle. To enhance the spread of tree legume and terrace technology into West Sumba YTN began servicing the village of Makamenggit. The leaders of YTN acknowledged that this village, which is close to the regional capital of Waingapu and well serviced, did not meet all of the criteria necessary to justify receiving attention from the agency. They said however, that because it lies on the main road between East and West Sumba, establishing activities in this village would provide an excellent opportunity to exhibit YTN's programme and technologies to farmers and government officials in West Sumba, thereby facilitating the programme's spread into that region. This illustrates two characteristics. First, YTN has chosen to enter villages not according to need nor to meet perceived needs but to actively promote its chosen technologies. Second, it verifies that YTN's policy of establishing its programme in West Sumba is not to identify the particular difficulties and needs of this region which is climatically very different from the east, but to enter this new region again with their same preconceived best technologies. To have such a policy in the contemporary situation supports the argument that it was a similar policy that WN/YTN followed when developing the programme in East Sumba.

More evidence for the notion that WN selected and promoted tree legumes and terracing because of their personal sympathies for this technology is supplied by WN's future plan in Sumba and Southeast Asia generally. Fisher *et al* (1993: 21) said in their three year operational plan for the period 1993 to 1996 that the programme's emphasis would continue to be on soil and water conservation (that is, terracing and hedgerows) and emphasise soil fertility and food crop production. This focus is despite indications that farmers in Sumba are not attracted to trees for these purposes but prefer horticultural and timber trees, and despite significant problems that they have experienced with this technology (to be outlined in Chapter 6). Perseverence with the technology into the future despite farmers' desires and problems indicates the priority given to it by WN's hierarchy.

The change to other species of tree legume following the psyllid infestation of *lamtoro* has been used to argue that YTN's programme is particularly adaptable to changing conditions. This one adaptation to an unavoidable environmental constraint however, does not reflect the flexibility of the programme. It instead indicates WN/YTN's desire to persevere with and protect this dominant preferred technology from failure so that it fulfils its potential as a major player in agricultural improvement. It shows that WN/YTN has been desperate to promote this technology. Programme controllers have not been amenable to farmers' desires to alter the preferred technology substantially and this demonstrates inflexibility.

It was, and continues to be, WN's policy to inordinately promote this one technology and YTN has inherited this bias. This technology was promoted in all WN activities in Southeast Asia in the early 1980s because at that time the activity was already favoured by Bunch, and perhaps the WN hierarchy, and was being endorsed and eulogised by them. Prevailing environmental conditions in select locations like Sumba allowed them to test the technology to see if it could fulfil its potential and their dreams. Hence, dogged adherence to the promotion of tree legumes and terraces was due to a liking for this technology by WN's hierarchy and a desire to <u>prove</u> that it was the best technology for upland regions. It was thought perhaps that this would lend the organisation ideological superiority in its struggle with what it considers to

be less appropriate agricultural intensification technologies, such as those of a high input nature. Moreover, the following statement by Fisher (1992a) indicates there was a consciousness of the need to win, not only the acceptance and favours of powerbrokers, but also the minds of ordinary farmers. He says that,

> "...fundamental change in farmer attitude may in fact be alley farming's greatest contribution - the validation of a conservation ethic and renewed confidence in the future of dryland farming in the uplands." Fisher (1992a: 9-10)

A final reason for emphasising the promotion of tree legumes and terraces comes from the extension approach developed by Bunch and World Neighbours. This approach has stressed the identification of a single highly effective technology that can act as an initial stimulus when the organisation begins servicing a village. Alternative technologies are not to be introduced into the community or made available to individuals until they have mastered the one initially promoted. WN/YTN determined that this initial technology in Southeast Asia's uplands should be terraces planted with legume hedgerows. Having made this decision they have been bound by principle to promote this technology alone. Obviously, the rigidity of such an approach, while perhaps being advantageous from an extension viewpoint, opposes the inclusion of farmer participation. Indeed, the approach's constraining nature and its inconsistency with participation has been observed by partners of WN. For example, Petch (1991: v) contributing to WN's 1981-1991 ten year assessment said that,

> "...the variability of upland environments mitigates against the widespread effectiveness of any one agricultural technology, as exemplified by the experience with alley cropping. This calls for modification of the Two Ears of Corn approach... We need to offer a range of ideas to farmers, including thoughtful improvements on indigenous technologies. Then a process of experimentation and monitoring is essential to determine the best combinations in a given area."

This verifies that despite YTN's discourse (outlined in section 4.2.4) suggesting that their approach is participatory, basing technology selection on farmers' felt needs, this is in fact not the case. They have been constrained by their donor agency's preconceptions of the best

technology and best method for promoting this technology. Only now are individuals from the donor level (such as Petch) beginning to question the wisdom of this approach.[14] Their arguments for change are evidence that to date the process has been non-participatory and consequently the technology being promoted is entering inappropriate conditions.

Hence, local Sumbanese did not participate in technology selection because the WN hierarchy had already made up their minds as to the most suitable technology. Farmers were not free to choose alternative technologies because WN principles emphasise the adoption of just one technology regardless of local conditions. There may have been good scientific and extension reasons for the selection of this technology and its individual promotion, but for this discussion the point is that this process is inconsistent with farmer participation and is indicative of a 'top-down' approach. Favouring of the 'tree-legume-on-terrace' technology by WN powerbrokers also explains the reluctance of recipients and local YTN staff to criticise or change it. If farmers selected the technology themselves they may be confident in saying that they now find problems with it and wish to make amendments. If the reason for the selection however, was the donors' own sympathies, and from the beginning of the programme those donors appeared more interested in its development than in the satisfication of farmer felt needs, it is not surprising that recipients and local staff should feel that the technology's welfare is more important than their own.

5.5 Conclusion

The promotion of a particular technology was given precedence over adherence to a participatory approach, the participatory approach being only used for the purpose of enhancing

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[14] Varying markedly from that which has been done by YTN are the recent statements of Fisher (1992b) also (Fisher played a central role in the development of YTN's programme as WN's area representative). He says that extension to farmers should now adopt a 'menu' or 'basket' approach (Fisher 1992b: 7). That is, farmers should be exposed to a range of technologies which they can then select appropriate to local conditions, experience and needs. This differs greatly from the approach promoting one proven technology which was supported by Bunch (1982) and adhered to by YTN.

adoption of the favoured technology. Participation can be used for the general purpose of achieving rural development, but it is contradictory to suggest it be used to promote a particular type of technology or activity. The technology or activity can only result from the process of participation; it is a product of that participation. World Neighbours however, is not alone in misusing a participatory approach in this manner. This study was conceived as a result of the same contradiction, it too was done in the hope that participatory approaches could be used to promote tree-planting. The literature review revealed that agroforestry, social forestry and tree-planting systems in general had enormous potential for the development of subsistence farmers in upland regions of developing countries. This was according to the outsider perspectives of theorists and development practitioners. The major constraints to tree-planting had been institutional and organisational, mainly a result of the 'top-down' nature of implementing agencies. It was suggested that NGOs be used because they could enhance farmer participation in the adoption process of tree-planting systems. Consequently, the feasibility of using participatory approaches to promote the adoption of tree-planting was being tested. It was not realised that this was a contradictory goal which necessarily precluded participation. It was also not known that WN/YTN had a technology bias. It was presumed that their participatory approach led to the formation of the technology. Examination of WN/YTN however, shows that they were using participation in a promotion role in the same manner that the researcher and numerous theorists had been tempted to do.[15] Having seen the experience of YTN it is obvious that this is a mistake. Genuine participation is compromised if the participatory approach is used in any promotion role. The only purpose of a participatory approach is to truly encourage participation. It is only after that goal has been achieved and the thoughts and desires of farmers heard that one can begin to think about appropriate actions in the area, and this too should be done in consultation with local people.

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[15] Many theorists and practitioners in NTT are pervaded by the preconception that agroforestry is the best technology for their region and all are tempted to misuse participatory approaches in an attempt to enhance its adoption. This was apparent at an agroforestry conference at Kupang's Agricultural Polytechnic in August 1991 where it was taken for granted that agroforestry was optimal in the development of subsistence farmers. Questions and discussion merely focussed around what was the most appropriate method for promoting this technology. Emphasis was placed on involving farmer participation.

Despite the lack of participation in YTN's programme, it still appears from programme reports (summarised in Table 5.1) and the quantity of tree legumes visible on the ground in Paberiwai, that farmers are adopting the tree legume technology in large numbers. This tends to contradict those theorists who advocate the use of participatory approaches and who say that without a suitable kind of participation the adoption of development oriented technologies will not occur. It appears that YTN has encouraged farmers to innovate in the absence of significant participation. The following chapters address the issue of the importance of participation in innovation. The quality of adoption that YTN has managed to achieve in the absence of participation is examined. Attention is then given to identifying and analysing the actual methods and processes responsible for encouraging farmer adoption.



Plate 13: Drying areca nut (*Areca catechu*) near Kalimbuwai, Desa Katikuwai. Along with *sirih* (*Piper betle*) it is one of the few products to be in continual demand and have a stable price.

Plate 14: Overnight damage to a dryland rice crop by wild boar, Desa Meorumba.





Plate 15: Farmer at Laru, Desa Katikuwai, has cut back his red calliandra (stumps and regrowth evident) and burnt clippings and weed debris on the site. Although not encouraged by YTN, farmers believe that this burning saves labour and sterilises the soil.

Plate 16: The corrugated iron roofed house on the left, possessed by a member of the village elite has received six official visits from YTN staff. The grass roofed house in the background, owned by a poor disabled man, has never been visited by YTN staff in any capacity. The policy leading to this disproportionate attention means that the village elite have greater ability to secure and make first use of resources coming into the village.





Plate 17: Extensive wet rice in Pinduwatu, Desa Katikutana, leads to surprise that YTN's dryland intensification programme should come to this community and resist adaptation.

Plate 18: Labour intensive alleycropping is unattractive to farmers of Pinduwatu because they already lack labour to carry out tasks generated by wet rice agriculture.



CHAPTER 6

QUALITY OF ADOPTION

6.1 Introduction

The previous chapter established that the actual level of recipient participation in YTN's programme is low. Despite this, YTN has encouraged farmers to adopt its technologies. Moreover, the most popular technology is one that is least consistent with farmer desires. This reduces the importance of participation in encouraging farmer adoption of innovations. Before the role of participation can be dismissed however, it is necessary to examine more closely the quality of adoption achieved by YTN. This chapter shows that in the absence of participation the quality of adoption of the tree legume and terrace technology has been low. This restores participation's importance in the innovation process. In the absence of participation, factors that have constrained the quality of adoption will be described. Towards the end of the chapter the quality of other YTN technologies is considered. The quality of their adoption has been better. This has resulted from greater consistency with farmer desires and needs and from YTN's structure. Efforts to promote horticultural and estate trees in particular, compare well to similar projects controlled by government agencies. It is concluded however, that because the programme as a whole was introduced in a non-participatory manner it has been imprecise, with preferred technologies being introduced alongside those that are unpreferred. This has led to varying success in the level of adoption achieved and reinforces participation's importance.

6.2 Real nature of adoption of tree legumes and terracing

The number of farmers adopting YTN's preferred tree legume and terracing technology is substantial. As shown in Table 6.1 (reinforcing the information contained in Table 5.1) this

technology has been adopted by almost all programme followers in the study villages. The planting of other trees is significantly less popular.

Table 6.1 - Tree types received from YTN by YTN recipients
(Values are % of respondent households)

Tree Types Received	Village				Average
	Praibokul	Wanggameti	Katikuwai	Katikutana	
Tree legumes only	30	60	35.7	30.3	**41.5**
Tree legumes & horticultural	50	31.4	39.3	42.4	**38.7**
Tree legumes & timber	0	0	3.6	3	**1.9**
Tree legumes, hort. & timber	20	8.6	21.4	18.2	**16**
Horticultural only	0	0	0	6.1	**1.9**
Horticultural & timber	0	0	0	0	**0**
Timber only	0	0	0	0	**0**
	100	100	100	100	100
No. of resp. households	10	35	28	33	106

Note: Horticultural trees includes estate crops.

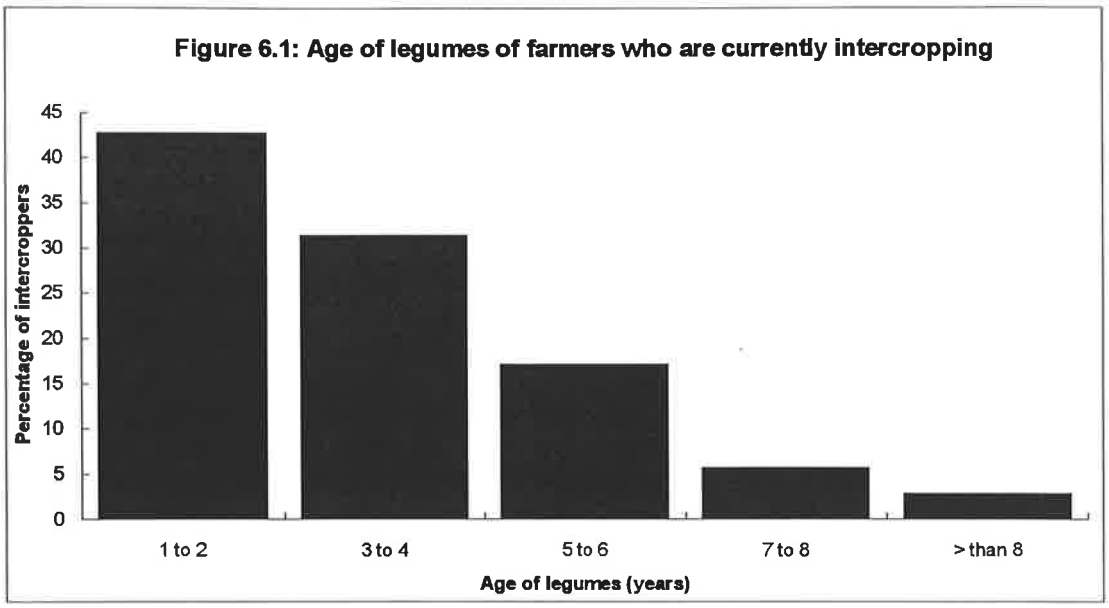
Even though all recipient farmers plant tree legumes and make terraces, more than half of these farmers do not use or maintain these gardens but have abandoned them. Abandonment means they are planting no tree nor food crops between the legume rows. This is different from fallow, as fallow implies some maintenance of the legumes or field while crops are not being grown. No maintenance is occurring in abandoned fields, the legumes have been left on average for three years and in some cases for more than five years, they are tall, bushy and unkempt. The current uses of farmers' terrace gardens according to their own classifications and the extent of abandonment is outlined in Table 6.2.

Table 6.2 - Current use of terraced gardens containing tree legume rows
(Values are % of respondent households)

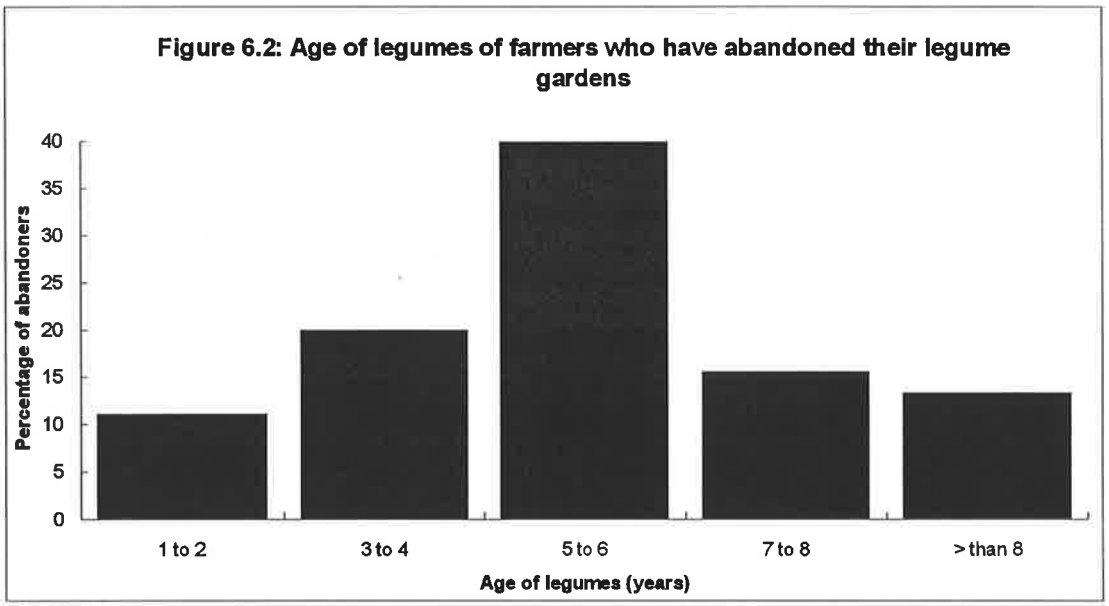
Use	Village				Average
	Praibokul	Wanggameti	Katikuwai	Katikutana	
Intercropping	40	36.4	11.1	36.7	**30.5**
Reopen with slash & burn	0	3	7.4	0	**2.9**
Turned to horticultural trees	13.3	3	33.3	3.3	**12.4**
Abandoned	40	57.6	48.1	50	**50.5**
Legumes have died	6.7	0	0	10	**3.8**
	100	100	99.9	100	100.1
No. of resp. households	15	33	27	30	105

Note: 'Intercropping' means that they have for at least the last planting season grown corn, rice or cassava between maintained legume rows.
'Reopen with slash and burn' means that they just reopened the garden this year using slash and burn after a period of abandonment.
'Turned to horticultural trees' means that farmers are planting horticultural or estate trees (sometimes even timber trees) in preference to food crops between the legume rows, using the legumes as shade trees in the short term and phasing them out in the long term.
'Abandoned' means that they are not cropping anything between the legume rows, neither trees nor crops.
'Legumes have died' means that the tree legumes initially planted have died.

Abandonment of tree legume gardens significantly reduces the technology's effect in assisting rural livelihoods. If the aim of the programme was purely land conservation then it would matter less that farmers are planting and then ignoring tree legumes rather than intercropping them. YTN's aim however, is to improve farmer livelihoods and assist their development by improving agricultural productivity. In this sense the tree legume on terrace technology is not helping. It is not increasing agricultural productivity because most farmers are not using it to intercrop and it is not contributing to sedentary agriculture, nor significantly reducing fallow periods as hoped. Its failure to contribute to sedentary, productive agriculture and farmer reluctance to intercrop legumes appears even greater from a temporal perspective. Of 116 recipients of the legume on terrace technology interviewed in the study villages, 80 percent had tried intercropping the hedgerows. Of these recipients however, over half have now abandoned those gardens. This indicates that farmers who have tried intercropping are dissatisfied. To get a better idea of intercropping's unpopularity, it can be pointed out that of the 30 percent of recipient farmers intercropping at present, 42 percent of these have hedgerows just one to two years of age; they are thus very small and intercropping them differs little from traditional cultivation. Seventy-three percent of these intercroppers have hedgerows under four years of age. This means they still need little maintenance. Very few farmers cultivate legume gardens for the long term. This supports the argument that the technology cannot lead to sedentary agriculture. Figures 6.1 and 6.2 (overleaf) show convincingly that farmers intercrop legume gardens while the legumes are small but then abandon those legumes when they get to above four years of age.



Note: From a total of 35 intercroppers interviewed.



Note: From a total of 45 abandoners interviewed.

It has been established that farmers plant tree legumes on terraces but then usually abandon those gardens and tree maintenance when the trees grow tall at around two to four years of age. Table 6.3 indicates that farmers' current use of their gardens is also the planned use that they have for that garden. It cannot be argued that garden abandoners will in the future reopen those gardens because 82 percent say that they have no plan, implying abandonment will continue. Similarly, those currently growing tree crops plan to continue using

the garden for that purpose only. Those currently intercropping say that they will continue doing that, although many plan to turn their gardens over to horticultural trees.

Table 6.3 - Plans of farmers for the use of their tree legume gardens
(Values are % of respondent households)

Plan	Respondent's current use of the garden		
	Intercropping	Abandoned	Changed to tree crops
Have no plan for the garden	0	**82.3**	8.3
Plant or continue to plant hort. trees there	**42.9**	5.9	**91.7**
Grow or continue to grow food crops	**50**	11.8	0
Food crops there now & then abandon it	7.1	0	0
	100	100	100
No. of resp. households, total 60	14	34	12

Not only have farmers abandoned their legume gardens and do not plan to reopen them but they have continued to cultivate traditionally. Small gardens planted with tree legumes are created on farmers' *hak milik* (certifiable) land near the main roads and village centres while vast, traditional slash and burn gardens persist in and around areas of scrub or forest. The popularity of retaining traditional shifting gardens is shown in Table 6.4. Of the 89 respondents in Table 6.4 (overleaf) who said that they continued farming a traditional garden, 18 percent admitted without prompting that this garden was in the forest zone. Farmers are not freed from traditional cultivation by the introduced technology, and that technology is not reducing pressure on forest areas where gardens continue to be cut. The continued importance of traditional cultivation is also shown in Table 6.5 (overleaf). This table reveals that despite the presence of the tree legume on terrace technology (for up to ten years in some regions) farmers continue to crop traditional gardens larger in size than legume gardens. In Wanggameti and Katikuwai, villages dependent on dryland agriculture, traditional gardens are on average twice the size of legume gardens (dryland gardens of all types are smaller in Katikutana and Praibokul as many YTN followers are in districts suited to wet rice). Of all respondents 95 percent had traditional gardens larger in area than legume gardens.

Table 6.4 - Percentage of tree legume planters who have maintained a traditional dryland garden

	Current legume garden use			Average for all YTN followers
	Intercropping	Abandoned	Tree Crops	
Legume garden only	20.8	0	0	**5.2**
Have traditional dryland garden also	79.2	96.5	100	**92.7**
Neither	0	3.5	0	**2.1**
	100	100	100	100
No. of resp. households	24	57	15	96

Table 6.5 - Average areas of legume gardens and traditional gardens of those farmers who have both garden types

Village	Legume garden area (Ha)				Traditional garden area (Ha)				
	Avg.	s.d.	max.	min.	Avg.	s.d.	max.	min.	Resp.
Wanggameti	**0.21**	0.16	0.5	0.05	**0.56**	0.28	1	0.1	17
Katikuwai	**0.25**	0.43	2	0.02	**0.52**	0.38	1	0.05	20
Katikutana	**0.07**	0.06	0.2	0.01	**0.25**	0.2	0.7	0.06	10
Praibokul	**0.13**	0.09	0.25	0.02	**0.3**	0.15	0.5	0.06	8
	0.19	0.28	0.5	0.01	**0.45**	0.31	1	0.05	55

Finally, examination of farmers' attempts to develop the technology themselves suggests that they are not interested in tree legumes. This leads to doubt as to the future sustainability of this part of the programme. Table 6.6 shows that a vast majority of recipient farmers have taken neither seed nor cuttings from their tree legumes to give to others who do not have the trees or to plant in their own gardens. If farmers were pleased with the trees, and truly desired them, it would be expected that they would spend more time collecting seed.

Table 6.6 - Percentage of farmers who have taken seed or cuttings from their tree legumes

	Village				Average
	Praibokul	Wanggameti	Katikuwai	Katikutana	
Never taken either	95.7	78.1	82.6	82.4	**84.2**
Taken for personal use	0	18.8	13	11.8	**11.6**
Taken to give to others and for personal use	4.3	3.1	4.3	5.9	**4.2**
	100	100	99.9	100.1	100
No. of resp. households	23	32	23	17	95

The notion that farmers' failure to collect seed indicates disinterest in tree legumes is rejected by supporters of this technology. They argue that many farmers are intercropping and so they cannot take seed because they have pruned their legume hedgerows. YTN itself however, recommends that farmers leave one tree unpruned every five to ten metres of hedgerow for seed. Thus, intercropping and seed collection are compatible. Furthermore, as indicated above, just 30 percent of recipients are intercropping. This means 70 percent of farmers have unutilised trees from which they could take seed. The other common argument is that the trees are too young. However, around 70 percent of abandoners' trees are more than five years old and so above the recommended age for taking seed from red calliandra (the predominant legume species). There are no excuses for not taking seed other than disinterest in the technology. YTN itself has acknowledged that the time is right for farmers to engage in seed collection. In 1993 the organisation promised thousands of kilograms of predominantly red calliandra seed to other NGOs, mainly from other areas in East Nusa Tenggara, for which YTN and the farmers were to receive payment. Most villages set themselves the target of collecting around 300 kilograms of seed from YTN following farmers. With the exception of Ramuk, there was no interest from farmers in collecting this seed. Wanggameti, Katikuwai, Katikutana, Praibokul and others, which had hoped to collect 300 kilograms of seed per village, managed around just 20 kilograms each, most of this came from the efforts of schoolchildren.

Although the number of adopters of YTN's preferred technology is impressive the quality of adoption by those recipients is poor. Most farmers plant tree legumes and then abandon them. They may intercrop hedgerows for the first couple of years when the trees are small and cropping amongst them is not dissimilar from traditional agriculture, but when the trees are large they ignore them. They do not plant more legumes by taking seed from their existing trees but revert back to solely practising traditional agriculture (which they had never given up). Some farmers use the legumes as shade trees to plant horticultural or estate trees but most just let the tree legumes grow with no plan for reopening them in the future. Having planted the legumes, farmers quickly lose interest.

The poor quality of adoption in the study villages supports the importance of participation and the satisfaction of felt needs. High quality adoption of tree legumes and terracing is not occurring in participation's absence. This is not to say that the absence of participation is the sole reason why farmers are unsuccessfully adopting the tree legume technology. It can be said however, that participation's absence has constrained programme planners from accurately conceptualising the character of the Sumbanese and their perspectives of their environment. This has inhibited the success of the introduced technology. Even if participation had been included however, it may have been impossible to develop a technology that could overcome these characters and conditions. The following section outlines some of the factors that have constrained farmers from adopting tree legumes as desired. Enhancing farmer participation may have meant adaptations could have been made to the programme so that these constraints could be overcome; however, this is not guaranteed.

6.3 Specific reasons for low quality adoption of tree legumes and terracing

6.3.1 Inconsistency of the technology with farmer labour availability and traditional labour patterns

In participation's absence a number of reasons why farmers dislike the technology have gone undetected. Some reasons are common to every study village but others arise from the specific character of particular locations. As suggested earlier, farmers perceive a shortage of labour to work their fields. This is a constraint to the technology throughout Paberiwai. It is commonly held that tree legume intercropping reduces labour burdens. The presence of hedgerows suppresses weed growth and increases soil moisture thus making the land easier to work (Pellokilla *et al* 1991: 135, Fisher 1992a: 7). Although legume intercropping eases these traditionally burdensome activities it introduces new labour tasks which farmers find particularly difficult. The most onerous of these tasks is the need to prune the trees and till the clippings into the soil (this must be done because farmers believe the burning of clippings is prohibited).

Farmers find pruning tree legumes more difficult than slashing scrub or forest because the latter activity need only be done once before planting. Tree legumes on the other hand must be pruned continually, throughout the growing season, so that they do not interfere with food crops. At this time farmers would prefer to be opening new dryland or wet rice fields. Those farmers who actually do intercrop their tree legumes, mainly farmer extensionists or YTN cadres, say that it is necessary to prune tree legumes from eight to ten times per season so that they do not interfere with food crops. Furthermore, on each successive pruning the task becomes more difficult because, as with red calliandra, if one branch is pruned five new shoots emerge. This has led to farmers pruning their legumes into the ground as they must prune below the shooting area to save labour.

Farmer dislike for pruning is illustrated in Table 6.7. It indicates that about half of the recipients of tree legumes have never tried pruning. This not only shows farmers dislike it but also further emphasises disinterest in the technology as they have not bothered to try and use the trees. Others have pruned in the past but have now given up on the activity.

Table 6.7 - Percentage of farmers who have pruned their tree legumes

	Current use of tree legumes			Average
	Intercropping	Abandoned	Turned to trees	
Never pruned	22.7	71.9	40	**50**
Pruned in the past	0	28.1	40	**20.3**
Prune at least once per year	77.3	0	20	**29.7**
	100	100	100	100
No. of resp. households	22	32	10	64

Note: The above table does not include those who recently reopened their garden using slash and burn techniques. Those intercroppers who have never pruned are farmers whose trees are still small.

Further doubt over the popularity of pruning arises from Table 6.8. This table shows that of the 30 percent of farmers who say that they do prune their tree legumes at least once a year, most of these actually perform this task just one to two times per year, the vast majority do not prune more than four times a year. This may suggest that it is only necessary to prune tree

legumes with this frequency to successfully intercrop. It is more likely however, that the data in Table 6.8 and its quite significant variation indicates that many farmers who say that they prune, do not in fact know the best frequency for pruning those legumes. This could imply that they do not actually prune, nor in that case intercrop, those legumes. It was necessary to account for the backgrounds of the respondents to evaluate the truth of their statements on pruning. Farmers who said that they pruned from five to ten times per year (the higher levels of frequency) were those who would be expected to know more about optimal pruning frequencies. For example, the two farmers who said they pruned nine to ten times per year were the only two YTN farmer extensionists spoken to in the study villages. They said it was essential to prune this often so that the legumes did not interfere with food crops. If this is the case how do 41 percent manage to intercrop when pruning just twice a year? Although not conclusive, this leads to doubts as to whether those farmers who said that they intercrop their legumes actually do this. It certainly adds to the notion that pruning is unpopular.[1]

Table 6.8 - Frequency with which those who prune tree legumes carry out that task

Frequency of Pruning	Number of Pruners	Percentage of Pruners
Less than once per year	1	5.9
1 - 2 times per year	7	41.1
3 - 4 times per year	4	23.5
5 - 6 times per year	2	11.8
7 - 8 times per year	1	5.9
9 - 10 times per year	2	11.8
	17	100

Intercropping's unpopularity may also arise because it requires alteration to farmers' traditional labour patterns. Due to the perceived prohibition on burning farmers must commence field preparation earlier than normal. As indicated in section 5.3.3 upon opening a garden which has been covered with trees and has a build up of humus, farmers believe the field must be

[1] The fact that most farmers do not prune tree legumes possibly undermines their ability to contribute to soil and water conservation, which is purported to be their greatest advantage. Soemarwoto (1991: 216) argues that excessive reforestation with tree legumes can cause water shortages, especially in areas with long dry seasons, such as NTT. He says that drought resistant evergreen legumes like *lamtoro*, *gamal*, *Cassia siamea* and *Sesbania sesban* are unsuitable for regreening in arid and semi-arid areas unless pruned regularly so that they do not reduce water availability through evapotranspiration.

sterilised. They say it is important to get the 'rawness' (*mentah*) out of the soil. Traditionally they do this by burning the field and then leaving it to dry under the sun for at least one month. In the absence of burning this process of sterilisation takes longer because all of the work must be done by the sun. Consequently, farmers must prepare their fields a couple of months earlier than normal. This means field preparation impinges upon the peak of the dry season when the Sumbanese are still engaging in ceremonial events. If the programme coordinator's tolerance of 'orderly burning' was communicated to ordinary farmers the problem could be overcome. This still may not attract farmers to intercropping however, because orderly burning varies from the unregulated burning traditionally conducted by farmers in that it is still highly labour intensive. Much effort is required to heap the clippings in the centre of terraces and then protect the stumps with earth.

Sacrificing participation in ceremonial events could free adequate labour for farmers to engage in earlier field preparation. They do not believe however, that this can be done. Participation in ceremonial events is not done for enjoyment (although it can be enjoyable) nor considered dispensible, it is a duty. Cultural and ceremonial activities include the arrangement of marriage and the performance of marriage ceremonies, funeral ceremonies and the dragging of massive slabs of rock for tombstones. These activities all demand significant amounts of time and the involvement of many community members. During the period of data collection, in the month of June, forty people from Wanggameti (mostly males) spent seven days in Katikuwai negotiating a brideprice for a young Pahulubandil male. Upon his return to Pahulubandil with his bride, most of the village then spent a further three days participating in the wedding ceremony. In the same village in September most of the population spent fifteen days of the month arranging and attending funeral ceremonies.

6.3.2 Agricultural disincentives for tree legume intercropping

Tree legume intercropping is also unpopular with farmers because it has agricultural disadvantages. Table 6.9 lists some disadvantages that farmers have experienced with the technology.

Table 6.9 - Sorts of disadvantages of tree legumes perceived by all YTN followers who feel that the legumes have disadvantages
(Values are % of respondent households)

Perceived Disadvantages	Village				Average
	Praibokul	Wanggameti	Katikuwai	Katikutana	
Cassava affected by legume roots	20	50	55.6	0	**36.8**
Trees incompatible with food crops	60	18.8	11.1	25	**23.7**
Fertility same as ordinary garden	20	12.5	11.1	25	**15.8**
Too much work (especially pruning)	0	0	11.1	25	**13.2**
Legumes give hiding place for mice	0	18.8	11.1	0	**10.5**
	100	100.1	100	100	100
No. of resp. households	16	9	8	5	38

There continues to be some concern over the relationship between trees and food crops grown together. Not only have farmers experienced shading of food crops by the legumes, they have noticed that the tree roots interfere with food crops, especially cassava tubers. Some farmers say that tubers are smaller when intercropped with legumes and many say that they taste bitter if grown in this manner. All tree legumes are said to be disruptive although most disturbance has come from the laterally spreading roots of white calliandra. Farmers dislike cutting these lateral roots because they say that the odour emanating when they are cut is nauseating. A further disadvantage of tree legumes expressed by farmers is that mice hide in the hedgerows by burrowing down around their roots where they cannot be dug out. From there they attack farmers' food crops.

One of the most crucial factors reducing farmer interest in tree legume intercropping is that the trees do not improve soil fertility as promised. Farmers have noticed that soil fertility

decreases after just two to three years as it does with traditional cultivation. This observation is supported by Sinaga (1990: 2) and Stoney (undated: 19) who noted that green manure from tree legumes was insufficient to supply all of the land's fertility needs. This meant fertility decreased markedly after the second consecutive year of intercropping and farmer incomes had not increased. In the isolated locations where soil fertility is improved, those improvements are only marginal and not justified considering the extra labour that farmers provide. Improvements in yields through intercropping can just as easily be achieved by devoting extra labour to the clearing of a larger shifting garden cut from the forest or scrubland. Indeed it appears that gardens cut from and shifted around the forest are more fertile than those relying on tree legumes for fertility. In Katikuwai the farmer with the largest rice harvest in 1993 was located in the forest zone. Farmers in the forest zone were able to sell excess dryland rice that year and it was primarily bought or requested from those living by the main road farming some of the most elaborate tree legume gardens. Farmer extensionists are supposed to have gardens which exhibit functional YTN technologies so that they can create an example to others of improved agricultural practices. The farmer extensionist of Katikuwai however, was one of those who requested and bought rice from forest zone farmers. What sort of example does this provide? It reinforces the notion that shifting cultivation in the forest is more productive than intercropping tree legumes.

Chromolaena odorata's emergence has further distracted farmer interest from legume intercropping. Locally called 'locust grass' (*rumput belalang* or *tai kabala*), this disturbance weed was first observed by the Mahu in the late 1970s and early 1980s after severe locust plagues. It has since spread from west to east across Paberiwai and is now found throughout the district. *Chromolaena* has magnified the weaknesses of intercropping (especially the minimal real gains in fertility) by providing farmers with another attractive location for fertile agriculture. Legume intercropping may have been able to compete with farming in the forest zone and the cultivation of *Imperata cylindrica* grasslands. Farmers remain somewhat loath to slash actual areas of forest in the forest zone, despite their productivity, because this activity is formally prohibited by government (although locally sanctioned meaning it continues at present).

Similarly, the farming of *Imperata* grasslands is unattractive because the fertility of these lands is poor and their preparation laborious (the roots of the grass must be dug out and the soil turned before planting can occur). Intercropping cannot compete however, with the new technique that farmers have developed of slashing and burning *Chromolaena*. Land under *Chromolaena* is generally very fertile (same as intercropping) and the labour required to prepare a garden is less. Farmers can slash and burn *Chromolaena* without upsetting the Forestry Department (as happens when they slash and burn forest) or YTN (as occurs when they slash and burn tree legumes). After burning they do not need to dig out roots (other than exceptionally large ones) and they do not need to till the soil. They can plant in the unturned ash after a period of drying as for the slash and burn of forest lands. Everywhere that *Chromolaena* is established and fertile, farmers give preference to its cultivation. This is most visible in Katikuwai. The majority of Katikuwai's agricultural lands have only recently been opened, being converted from forest about 70 years ago. In this environment where the land retains some fertility and has not been over-exposed to erosion and grazing *Chromolaena* is extremely fertile and widely established. In comparison, on the *Mapu* grazing lands of Wanggameti and Praibokul it is rare, and stunted where it does occur. The fertility of *Chromolaena* in Katikuwai contributes to that village having easily the lowest rate of legume intercropping, as evidenced in Table 6.2. Most farmers abandon their tree legumes or use them for shade trees and then use the *Chromolaena* lands for agriculture.

Another factor emphasising the inability of legume intercropping to noticeably enhance soil fertility is the types of lands on which trees are planted. YTN, through its own policy, has encouraged farmers to only plant tree legumes on *hak milik* (certifiable) land which is normally located by the main roads. The agency has actively discouraged farmers from planting them in the forest zone by refusing to service farmers in these areas. This is to be consistent with state policy which demands farmers move out of the valleys and forest zone. YTN believes that with this policy, its technology can be used to entice farmers out of the zone. It was observed in the study villages however, that due to topography most of the main roads follow the ridge tops which have thin, infertile and compacted soils, as a result of grazing and erosion. They are also

distant from water. YTN's technology with its minimal fertility advantages has been unable to make these lands an attractive proposition. Consequently, farmers have planted tree legumes in the areas designated but have been dissatisfied with them and have gone back to the forest zone or *Chromolaena* lands to carry on with traditional cultivation. Nevertheless, even if tree legumes were freed from these *hak milik* lands it is doubtful whether they would be planted in the forest zone or on *Chromolaena* lands because these areas are already fertile and do not need legumes to increase fertility. Perhaps the only instance where farmers would plant and maintain tree legumes spontaneously is where there no longer existed any alternative fertile lands that could be more easily prepared than legume intercropping. At present however, these lands are abundant.

Perhaps farmer preference to crop fertile *Chromolaena* lands, rather than intercropping on *hak milik*, also arises from a culture amongst the Sumbanese encouraging them to degrade both public and private resources if they have the opportunity. This syndrome arises daily in Sumbanese life and is exemplified by the rationale used to justify the popular method of cutting bark from cinnamon trees. Farmers know that if they cut the bark of forest growing cinnamon trees from just half of the tree then it will not die. This will allow them to harvest the bark of the tree again when it grows back, in about one year. Farmers feel however, that if they take bark from just half of the tree then it is likely that somebody else will come and harvest the other half. Consequently, the tree will die anyway. Hence, upon finding an untouched cinnamon tree they harvest all of its bark. This ringbarks it and kills it immediately. Another example of the syndrome was provided by a young farmer living in a cluster of houses who routinely released his pig to wander around the community at night. The farmer was asked whether this was a wise practice given that many of the houses were surrounded by small gardens and the pig could destroy crops growing in these fields. The farmer replied that he knew it was likely that the pig would destroy crops. He said however, that everybody else let their pigs loose at night and since only he had cassavas ready to harvest at that time, he may as well let his pig join those of other people in eating his cassava. The syndrome is also manifested in the common occurrence of livestock theft and acts of sadism towards impressive horses or the animals of

wealthy people by others who are envious. In relation to *Chromolaena* lands therefore, it may be the case that this syndrome motivates people to use them. Consistent with the rationale described above, farmers may use open access *Chromolaena* lands even though they recognise that this practice is degrading and illegal because everybody else is making use of their fertility. They will be disadvantaged if they restrict themselves to *hak milik* land because they will miss out on this short term opportunity while it is available (given that fertility is likely to decline).

Due to the presence of fertile, easily prepared *Chromolaena* lands; local governments' tacit approval of the use of forest zones for shifting cultivation; a belief that these fertile lands are already being used by everybody else to their advantage; the restriction of legume planting to *hak milik* land near main roads; and the minimal fertility advantage of legume intercropping, farmers actually consider themselves unfortunate if they solely practice legume intercropping. It even appears that those who are dependent on dryland cultivation for their livelihood are less attracted to legume intercropping and feel more unfortunate if they have to follow it, than those who extract their livelihood from other activities such as wet rice cultivation, livestock rearing and trading. The latter maintain their legume gardens far better. This is although the technology is intended to assist the productivity of dryland agriculture.

This phenomenon appears most clearly in Wanggameti, at the two adjoining communities of Pahulubandil and Halawala. In the past Pahulubandil residents engaged in shifting cultivation, cutting gardens from the forest on the sloping lowlands of Wanggameti at a place called Palumung. They were relocated to the flat uplands at Pahulubandil so that they would stop degrading the forest and be near the main road where it would be easier to supervise them and give them extension. The land to which they were relocated was infertile *Mapu* grassland which had thin, compacted soils.[2] YTN encouraged them to plant tree legumes

[2] In relation to the dominant landscape types in Paberiwai, the *Mapu* grasslands appear to be the most infertile other than rock. Both *Imperata* grass and *Chromolaena* find it difficult to establish on these grasslands which are subject to both burning and intensive grazing. Before the introduction of *Chromolaena*, a stunted *Imperata* grass established itself in the more fertile regions of the *Mapu* grasslands, such as in moist areas or areas more recently converted from forest (as indicated by Seavoy [1975: 51] the intensive grazing of these areas would not favour *Imperata*). At the edge of the *Mapu* grasslands where they met the forest *Lantana camara* flourished. Now *Imperata* and *Lantana* have vanished from the *Mapu* grasslands to

and try intercropping at this stage. Farmers did not request the technology nor did they participate in its selection but they adopted it. After a couple of years however, most farmers abandoned their tree legume gardens and returned to the sloping fertile lowlands where they could cut gardens from the forest; they moved to a new lowland site at Tama. The problem was that the agricultural environment in the uplands did not facilitate good returns. All farmers felt that the lowlands were more fertile. The soils at Tama although sloping are new, deep and brown, those at Pahulubandil have been subjected to years of grazing and are compacted and eroded down to the red undersoils. Agriculture is restricted to the flat land between hills which is not extensive. It is too dry for wet rice and lacks fertility for dryland rice. Furthermore, these lands abut the grasslands meaning cattle move onto them and destroy crops. Farmers appreciate the fertility enhancing aspects of red calliandra but its influences do not outweigh the benefits derived from shifting cultivation on new soils, thus they relocated their gardens. They have not planted legumes on their new sloping gardens because of YTN's principle not to service farmers with seed if farming in the lowland region. Pahulubandil farmers consider cassava the only crop suited to the infertile uplands. They think corn and dryland rice can only be grown on fertile forest soils. They feel that cassava however, is the crop least suited to intercropping with tree legumes.

Halawala's history is the same. Farmers were and are being moved out of a sloping lowland region called Hambongu to an upland area by the side of the main road at Halawala. Here they must farm land of the same type endured by farmers at Pahulubandil. Indeed the uplands of Pahulubandil are identical to those at Halawala being adjoining lands and just one kilometre apart. Farmers were encouraged to intercrop tree legumes and they did. It appears however, that Halawala farmers have been able to sustain themselves on the uplands and not return to the lowlands. The majority of their legume gardens are pruned and intercropped. Thus, the question arises as to how Halawala farmers managed to continue intercropping while those at Pahulubandil succumbed to the constraints of intercropping on the uplands and the

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be replaced in the slightly more open fertile areas by stunted stands of *Chromolaena* and at the edges near the forest by fertile stands of *Chromolaena*. To date however, *Chromolaena* has also been unable to outcompete the *Mapu* grasses on the most infertile land of the open plains.

temptations of slash and burn of forest? A common local explanation is that Pahulubandil farmers are lazy and ignorant and that Halawala farmers have succeeded in intercropping and sedentary agriculture on the uplands because of their industry.

In reality however, Halawala farmers have not successfully intercropped legumes on the uplands. In 1993 they received a very poor rice harvest because of aridity on the uplands and an early end to the rains. They ran their cattle through their fields to eat the stalks of rice which did not fruit. The reason for the varying willingness to intercrop on the uplands does not arise because Halawala farmers can succeed where those from Pahulubandil fail. It arises from the predominant livelihood activities of farmers from each community. The majority of farmers from Pahulubandil are economically weak. Few possess cattle and most are dependent on dryland gardens for their livelihoods. If they do not get sufficient yields from dryland gardens then they struggle to survive. Their only extra income comes from the sale of forest products, such as *gaharu*, which they spend most of their spare time looking for. Residents of the small community at Halawala in contrast are not dependent on dryland cultivation for survival. Those at Halawala with the most noticeable tree legume gardens by the main road include a school teacher from West Sumba who is also a major cattle owner; two brothers living in individual households who are sellers of household goods at the district market at Tana Rara; the Livestock Division's extension officer for Paberiwai who married into a Wanggameti family and keeps many cattle in this village; family of the livestock extension officer who in addition to a little farming spend most of their time guarding and herding the extension officer's cattle; and family of the village elite who guard their noble's cattle. Residents from Halawala therefore, derive income from wages, cattle and trading and hence do not worry when their upland gardens are infertile and fail; Pahulubandil farmers do not have this luxury.

This explanation is strengthened by observing those residents of Pahulubandil who have not gone to Tama and those residents of Hambongu who have resisted moving up to Halawala. Those remaining at Pahulubandil include the local GKS (Sumba's Christian Church) clergyman who receives a wage and the family of the local noble who has many cattle. There are many

permanent houses at Pahulubandil but their owners only congregate at them when meetings or ceremonies are held at this complex. At other times they reside in their garden houses in the lowlands where they can guard their fields. Those who resisted going to Halawala and remain at Hambongu are again farmers dependent on dryland cultivation for survival who see no advantage in moving to the uplands. As shifting cultivation has been prohibited in the Hambongu lowlands farmers have commenced, on their own initiative, planting candlenut and coffee trees in this area for income. They have also intensified exploitation of forest products, especially *loba* (*Peltophorum pterocarpum*).[3]

6.3.3 Preference to use spare labour in off-farm activities

Availability of off-farm activities, more profitable than tree legume intercropping, has also weakened farmer resolve to devote extra labour to YTN's introduced technology. As emphasised above, farmers greatly dependent upon dryland agriculture are also least attracted to legume intercropping and most attracted to traditional cultivation and profitable off-farm activities. They cannot afford the luxury of devoting labour to activities giving lesser returns. Off-farm activities that have distracted farmers from maintaining tree legume gardens include state subsidised road construction projects and Forestry Department reforestation projects (*Reboisasi*). Farmers provide labour for these projects and in return receive money and food. YTN personnel have criticised farmers for taking part in these projects when it leads them to neglect maintenance of the YTN technology. They are also critical of the projects themselves which they see as inferior development programmes. These projects however, actually help farmers in the short term. Food and money provided alleviates farmer hunger during annual famines that continue to plague the mountain regions. Although operative for a decade, YTN's programme has been unable to prevent these food shortages. Its attempts to increase

[3] Farmers from Paberiwai sell the bark and leaves of *loba* trees to traders attending their markets. One *ikat* (one roll of bark filled with a handful of leaves) fetches Rp 100-300. These traders then sell the *loba* to Sumbanese from the coastal districts. People from Rindi and Prai Lui in particular, demand this product for use as a yellow dye in their famous weavings.

agricultural productivity in the short term have failed. Those adhering to YTN's technology may receive long term benefits but in the short term farmers get little comfort from the programme. Without these projects farmers would probably remain uninterested in legume intercropping and the effect of famines would be worse. These projects therefore, do not distract interest from YTN's technology, rather farmers are drawn to the projects because of the inability of YTN's programme to meet their short term needs.

To satisfy short term needs farmers also engage in their own extractive activities. When farmers have spare time they prefer these activities which provide immediate and significant rewards over development of YTN's technology. Farmers have two major activities, they collect and sell fish from the coastal regions and they collect and sell forest products. The first activity is done by only a few young and mobile farmers but the second is popular amongst all Sumbanese especially those living in and around the forest. Young males from Paberiwai with access to some method of transportation normally travel to the beachside areas of Karera, in East Sumba's south-east to gather from the shallows a species of immature fish called '*nener*'' (*benih ikan bandeng*, immature milkfish). These are sold for Rp 10-15 per head to numerous buyers from Waingapu who sell them to Javanese fish farms. The '*nener*' season continues throughout the wet season. At season's end the searchers return to Paberiwai to help their families with harvesting and field preparation for the following year and to engage in forest exploitation.

Exploitation of forest products is popular amongst Paberiwai's residents generally. As stated, farmers much prefer to spend time gathering forest products than committing labour to an intercropping activity which only marginally increases yields. Farmers in the study villages extracted from the forest a wide variety of products for both subsistence and sale. Some of these are listed in Appendix D. The most profitable product sold recently has been *gaharu* (*Aquilaria malaccensis*). Known also as aloes wood or eagle wood, *gaharu* results from a fungal infection in *Aquilaria* trees (Jalaluddin 1977). This produces a valuable resin that is fragrant when distilled and used in Chinese and Southeast Asian medicines and incense (Beer and

McDermott 1989: 39). In Paberiwai *gaharu* extraction commenced in the early 1980s. In 1983-84, corresponding with a *gaharu* boom throughout Indonesia (Jessup and Peluso 1985: 81), many farmers in Sumba were collecting around 50 kilograms of high quality *gaharu* wood per year. This sold for up to Rp 150,000 per kilogram. During this period, *gaharu* hunters came from all over Sumba, staying in the more extensive protection forests for days at a time. They resided in large camps of thirty to forty persons where certain individuals were resident merely to cook for the collectors. *Gaharu* extraction is still practised by those living near the forest but farmers currently collect only about one kilogram of wood per trip and about ten to twenty kilograms per year of lesser quality wood.[4]

Before farmers realised *gaharu's* value they extracted and sold much cinnamon (predominantly from the higher altitude forests) and trapped birds (especially the Sumbanese orange-crested cockatoo, *Cacatua sulphurea*). As these precious goods became increasingly rare farmers commenced selling large quantities of less valuable products such as *loba*, and *melinjo* (*Gnelom gnemon*) and root crops including varieties of ginger. The number of farmers searching for saleable forest products is shown in Table 6.10. This activity is most popular amongst those living around the extensive Wanggameti forest.

Table 6.10: Percentage of farmers interviewed who currently extract, or have extracted in the past, major saleable forest products

Name of forest product	Percentage of farmers in each study village extracting that product now or in the past											
	Praimbana (Resp. = 26)		Praibokul (Resp. = 20)		Meorumba (Resp. = 15)		Wanggameti (Resp. = 39)		Katikuwai (Resp. = 37)		Katikutana (Resp. = 43)	
	Now	Past	Now	Past	Now	Past	Now	Past	Now	Past	Now	Past
Gaharu	7.7	15.4	30	5	0	6.7	82.1	5.1	70.3	10.8	25.6	39.5
Loba	0	0	30	0	0	0	41.0	0	10.8	0	8.1	9.3
Cinnamon	0	0	0	0	0	0	28.2	5.1	37.8	13.5	14.0	16.3

[4] Farmers of Paberiwai recognise five classes of *gaharu* wood. *Kamalapunglu* or *Teri*, the lowest class, is extracted from parts of the tree which have been previously cut then abandoned but have now begun to rot; *Tanggung*, has reasonably thick and long *terasi* or resin; *Buku keras*, is resin occuring in tree roots, it is dense but not black; *Buku buku*, is found in the boles of trees and is round in form; *Super*, is like asphalt, it is black and contains more resin than wood. In the 1990s farmers usually get the lowest class and at best may find some *Buku keras*.

In lower elevation forests significant quantities of sandalwood (*Santalum album*) and *kayu kuning* (yellow dyewood) remain. These are very valuable but most farmers are reluctant to sell them because of strong Forestry Department prohibitions. Forest exploitation also rewards farmers with food supplements, especially green vegetables (fern leaves or *sayur paku*, and leaves of *ri rungat* and *melinjo*). Farmers travelling to the forest normally hope that they will find *gaharu* or other saleable goods but if they fail in this central aim, they never return home empty handed. While travelling through the forest they set traps for jungle fowl (*Gallus varius*, which are saleable) and collect food products, medicines and other useful materials such as rattan. The search for forest products is therefore, guaranteed to give farmers an adequate return for the time that they invest. As a result, farmers prefer this activity to intensification of legume gardens.

6.3.4 Dissatisfaction with other functions of tree legumes and problems with the concept of multi-purpose trees

Most reasons so far, as to why farmers have abandoned tree legume gardens, relate to the inadequacy of legumes to contribute to soil fertility and therefore, increase agricultural productivity. Tree legumes are also neglected however, because they do not fulfil other purported uses as well as alternative trees or crops (many of which farmers have easy access to). YTN suggests that as well as contributing to soil fertility and preventing erosion, tree legumes can provide fuelwood, fodder, construction timber and act as a shade tree. Farmers have found however, that the current range of tree legumes are not optimal for any of these purposes. They therefore neglect the trees and do not cut them to use. For example, farmers agree unanimously (especially the females, who are responsible for meal preparation), that tree legumes such as red calliandra and gamal are not good fuelwoods. They are green and take a long time to dry, they are very smoky and the smoke makes one's eyes water. They also burn too quickly and have no coals. This makes them unsuited to most cooking situations other than the boiling of water. It is not that legumes cannot be used for fuelwood. As other optimal

fuelwoods are available however, farmers choose to continue exploiting the latter. Legumes are useful in areas where no other fuelwoods are available. They cannot however, reduce pressure on existing trees which better fulfil this purpose.

Dissatisfaction with tree legumes for fuelwood is so great it was openly expressed by the wives of YTN farmer extensionists. It was also illustrated by women in Laironja who prefer to travel to the forest to collect wood rather than use vast stands of abandoned red calliandra surrounding their community. Similarly, at the Pinduwatu quarterly meeting women travelled to and collected fuelwood from the grasslands rather than using abundant legume stands around their houses. Specialist fuelwoods preferred in the study villages include *kosambi* (*Schleresia oleosa*), *kananggar* (*Dillenia indica*), *kandino meting* (*Melochia sp.*), *cemara hutan* (*Podocarpus imbricatus*), *kaiyarak* (*Quercus priformis*), and some species of introduced *Acacia*.

Current tree legumes are also less than optimal in providing fodder and shade for other trees. Tree legumes are at most supplementary feed for livestock (Piggin 1991: 113). This means farmers still find it necessary to release their cattle in the grasslands. Farmers also choose this practice because livestock ownership means that they are taxed for using the grasslands regardless of whether their animals are tethered or not. Having released their animals to wander the grasslands it becomes impossible for farmers to cut tree legumes to supplement their diets. Farmers have been attracted to introduced species of fodder grasses which may make it possible to keep livestock permanently tethered and fed with these grasses. However, the promotion and availability of tree legumes has been greater to date.

Farmers have also been dissatisfied with red calliandra and *gamal* as shade trees for horticultural trees and estate crops. They have used tree legumes as shade trees because of their inability to increase agricultural productivity. They have however, been dissatisfied with them for this purpose also and have commenced abandoning the gardens altogether. Tree legumes' failure to act as shade trees has been experienced by farmer extensionists themselves. An extensionist from Ramuk found that *gamal* defoliates in the dry season and red calliandra

dies back in this season meaning both provide inadequate shade. At Katikuwai, a YTN cadre found that his red calliandra trees generated sufficient shade but that coffee trees below them still died. Farmers keen to plant horticultural trees (the majority of Sumbanese farmers) are now beginning to plant shade trees which have specialised shading abilities such as the banana, and introduced *Albizia* species and *dadap* (*Erythrina sp.*). When farmers know that these trees are available they are attracted to them. YTN has given priority however, to the establishment of tree legumes on the basis that they are more multi-purpose.

Tree legumes promoted also have little value as construction timber. Red calliandra can be used to construct rudimentary garden houses but for little else. Mahu oral history identifies a number of local trees that are particularly resistant to rot and which are reputed to have been able to stand untreated for 200-300 years in traditional *marapu* houses. Now referred to as class woods these trees include *Kapali* (*Ixora sp.?*) and *Mayela* (*Artocarpus glaucus?*); *Kunjur* (*Cassia fistula*, grows on the grasslands); *Kiru* (*Dysoxylum sp.*) and *Kanawa* (*Pterocarpus indicus*); *Kapehu* (*?*) and *Linu* (*Glycosmis sp.?*); *La Nggapa* (*?*) and *Kanunu* (*Drypetes ovalis*); and *Manera* (*Aglaia eusideroxylon*). As farmers continue to have access to these trees, traditionally recognised as providing high quality timber, they neglect to use legumes for this purpose.

Finally, it has been stated that some farmers would like to slash and burn their tree legumes. However, even when incorporated into a semi-traditional system like this, tree legumes are less than optimal when compared to *Chromolaena*. Unless special care is taken, the slashed legumes do not reshoot after burning. This means the legume hedgerows are lost, together with the seed and time that farmers spent planting them. In contrast, if *Chromolaena* is slashed and burnt the *Chromolaena* always returns to revegetate the field.[5]

[5] It should be noted that farmers lament the loss of *lamtoro* (*Leucaena glauca*) which with regard to these last two functions was vastly superior to contemporary tree legumes in that it provided construction poles of reasonable quality and could sustain a reasonable degree of burning and reshoot. Piggin (1991: 112) says that another advantage of *lamtoro* was that it demanded less phosphorous and thus could thrive in a greater range of situations including the very infertile.

One reason why tree legumes were promoted is because they are multi-purpose trees. This has been an argument to give them preference and priority over other tree types. However, while tree legumes have a variety of functions they do not fulfil any of these functions optimally. Specialist trees are more popular because they provide exactly what farmers want. Therefore, while specialist trees are still accessible to farmers they are utilised in preference to multi-purpose trees. Priority given to multi-purpose trees by YTN's programme contradicts the organisation's principle of diversification. Under a principle of diversification farmers should be provided with a large number of specialist trees with completely different functions rather than four different species of multi-purpose tree none of which fulfil any specific purpose.

6.4 Quality of adoption of other YTN technologies

As described, the quality of adoption of YTN's favoured technology (tree legumes and terracing) has been low. In participation's absence, farmer problems and dislikes with the technology, arising from its inconsistency with their conditions, have not been identified. Overemphasis on this one technology has no doubt constrained the programme's impact. The aim here however, is not to be critical of either YTN's programme or approach. The intention has merely been to determine the existing level of participation and the effects of this on innovation adoption. As tree legumes and terracing have been most widely adopted, attention has focussed on that technology. The low quality of adoption suggests strongly that participation is important. It must be noted however, that despite problems with tree legumes and terracing resulting from minimal participation, YTN's programme and approach (which has a certain rigidity and 'top-down' character) has nevertheless contributed to improving the livelihoods of the Sumbanese, in a manner to be discussed. Although not reducing the importance of participation, this suggests that approaches with 'top-down' characteristics, that are not entirely participatory, can still contribute to rural development.

Just as the quality of adoption of the tree legume and terracing technology has been constrained because of its inconsistency with farmers' needs and desires, the component of YTN's programme promoting horticultural, estate and forest trees has experienced reasonable and growing success as a result of its conformity with these desires. As mentioned, YTN's approach has resulted in some awareness of farmers' conditions. This means the promotion of these technologies is related to farmer participation in monitoring and evaluation. Given the general absence of participation in YTN's approach however, this has resulted essentially from good fortune. It is fortunate that, in this instance, YTN's preconceptions and principles of desirable technologies, happened to correspond with farmer desires.

Although until very recently horticultural, estate and forest trees have been adopted in small quantities, overall (in the study villages) the quality of their adoption has been better than previous attempts to introduce trees of this type. This is one of the programme's achievements. In the past horticultural and estate trees were supplied to farmers by BANGDES (the regional government's village development body). They instituted a scheme which purchased trees using 'village subsidy' funds (distributed by regional government for development activities at the village level). Data collected from 150 households in the study villages, which had received trees under this subsidy funded programme, indicated that just 50.4 percent of the saplings distributed to farmers survived. In contrast, YTN's 1991/92 annual report indicated that of horticultural and estate trees planted by their followers, 86 percent survived (Yayasan Tananua 1992: 41-42). YTN's data indicates however, the survival rate of trees just one year after planting. Data collected from 41 households that had received horticultural and estate trees from YTN indicated that of all saplings received by farmers over time just 59 percent of those trees survived up to the present. Nevertheless, this is still an increase of almost 10 percent in the survival rate of trees provided under YTN's programme. Furthermore, a greater percentage of trees provided by YTN and surviving in farmers' fields are trees (including bushes and vines) foreign to farmers that have previously been difficult to establish, such as *salak* and vanilla. Trees surviving under the subsidy programme were often common species already familiar to farmers, such as varieties of citrus and coconut.

YTN's success in getting farmers to successfully establish horticultural, estate and forest trees stems from its approach. This approach contrasts sharply with that of government agencies. First, YTN provides farmers with seed only, so that they themselves nurse the saplings that they will later plant. In the past, farmers unwilling to do this received saplings nursed by somebody else in their village (often an extensionist). Nursing trees in the villages has overcome a major factor constraining the survival of trees provided with subsidy funds, that being the nursing of saplings in the regional capital of Waingapu and then their transportation by truck to recipient villages. Transporting saplings in this manner resulted in many being damaged in the truck and meant that they often reached the village late, after the optimum planting season. It also frequently led to saplings sitting at the drop off point without protection or maintenance for days. The arrival date of the truck was not known by recipients and consequently each household had to be notified of its arrival and then make their way to the place of collection when they had time.

YTN's ability to get farmers to successfully establish horticultural and estate trees is also due to their accompanying the provision of seed and saplings with technical information on tree maintenance. Trees provided under the subsidy programme came with no extension except for rudimentary advice given by the village head at the drop off point on the day saplings were collected. Indeed, the structure that YTN has established to transfer technical information to farmers on a range of predominantly agricultural topics (be it requested or not) is its greatest service to Paberiwai's residents. This structure, constituted by village based extensionists, quarterly meetings and cross visits, fills a gap left open by government agencies. State agencies' inability to provide farmers with technical information is revealed in Table 6.11. This table indicates that 72 percent of households interviewed in the study villages had never been visited by anybody from any government department above village level, and that 89 percent had never been visited in either their homes or gardens by an agricultural extension officer. This contrasts significantly with information in Table 5.16 in Chapter 5 indicating that more than half of YTN recipients (a significant proportion of the total households in villages following for more

than five years) were frequently visited by YTN staff and less than 9 percent had never been visited.

Table 6.11 - Percentage of farmer households which have been visited by extension officers from various government departments

Visited by	Percentage of households in the study villages						
	Pbl	Wgm	Kwi	Kta	Pba	Meo	**AVG**
Agricultural extension officer	10.7	7.1	16.7	7	25	3.3	**11**
Forestry department officer	0	0	12.5	23.3	10.7	0	**8.8**
Livestock	0	0	8.3	0	35.7	0	**6.6**
Family Planning	7.1	0	16.7	2.3	17.9	0	**6.6**
Social	0	0	0	18.6	0	0	**4.4**
Health	0	0	4.2	14	0	0	**3.9**
Never from any government dept.	89.3	92.8	62.5	60.5	32.1	96.7	**71.8**
Never had ag. extension officer	89.3	92.8	83.3	93	75	96.7	**89**
No. of respondent households	28	28	24	43	28	30	**181**

Two additional points need to be made in relation to government extension and Table 6.11. First, even when one accounts for the preference of government officers to call at the home of the village head, RK (hamlet head) or occasionally the RT (neighbourhood head) and give extension via group meetings, it was still found that more than half of farmers in the study villages had never received information in this manner. Furthermore, this is an inferior form of technology transfer when compared to the personal nature of YTN's method. Second, the attention that farmers in the study villages have received from Agriculture Department extension officers is even more minimal when it is considered that almost all of those who confirmed that an officer had come to their home, said that this was during and related to the *Gogo Rencah* (GORA) programme, of the late 1980s. This was a provincial programme encouraging farmers to adopt a new variety of rice, suited to drained wet rice land, intended to increase the size and reliability of yields. Farmers received seed and intensive extension from Agriculture Department officers accompanied by soldiers. Before and since this programme most farmers, in the study villages, received no attention whatsoever from agricultural extension officers.

The lack of attention received by farmers in Paberiwai from Agriculture Department extension officers results from the structure of the department's extension service and the

culture and behaviour of individual officers. The major structural constraint is a shortage of staff. There are just two government extension officers in Paberiwai. Both of these are centrally stationed, one at Tana Rara and the other at the district capital of Kananggar. These two officers must service a population of 22,000 people spread across 16 mountainous villages. Their task is complicated by not having personal transportation and by a regulation requiring them to attend a *Balai Penyuluh Pertanian* (extensionists' head office) outside of the district, three times a week (although this formality is never adhered to). This means that they cannot properly service the village of their residence let alone other villages. Other factors weakening the commitment of extension officers are low rates of pay (just Rp 90,000 per month), a lack of supervision and minimal knowledge of the technologies promoted (which are often inconsistent with their training).

The few government extension officers based at the village or district level derive little support from their numerous counterparts located in the regional capital of Waingapu. Specialist extensionists based in Waingapu possess individual means of transportation and receive substantial travel allowances, however, they often dislike travelling to and spending time in the villages, especially in remote districts. Many are unfamiliar with districts like Paberiwai and they find them uncomfortable to remain in for extended periods. This results in part from a tendency of these specialists to originate from urban areas or to have spent many years in larger towns while obtaining the tertiary education necessary for their position.

Reluctance to spend time at the village level means that regional government staff are also sometimes derelict in their performance of tasks planned in the villages. An example of this was observed in a study village where staff from a government department were negligent in their completion of an assignment because of eagerness to return quickly to the urban areas. In this instance two officers of the regional government arrived at the village head's home to organise a programme aiming to help moderately needy families build better houses, at the main road, by supplying them with some materials. The village head together with other village leaders were to identify families that should receive assistance. The officers were then to call all

of these families to a meeting to determine the materials they desired. Each attendee of the meeting was to receive *uang duduk* (sitting money) to reimburse them for time lost. After the meeting they were to sign a register showing that they were the identified beneficiaries of the programme. However, to complete this assignment as planned, especially the arrangement and conduct of a meeting, would require the officers to remain in the village for two days at least. They were not prepared to do this and so decided against holding the meeting. Instead, after the village leaders had identified appropriate families, they asked those leaders to sign for the the families identified, on the relevant form. They determined amongst themselves suitable materials and distributed the 'sitting money' to the village leaders according to the number of persons they had signed for. This permitted the officers to arrive at the village in the evening and board a truck back to Waingapu before lunchtime the following day. A problem only emerged when the officers did not clarify to the leaders that the form was to be completed in triplicate. In the absence of adequate supervision from the officers, this meant that different leaders signed for the same heads of households on the form.

According to village and district heads it is common for some officers of the regional government to spend less time than arranged in the villages thereby leading them to neglect their duty. These village and district heads admit that they agree to sign falsified travel documents (SPJ, or *Surat Pas Jalan*) verifying that particular regional officers have spent longer in the villages than they have in fact done. This allows those officers to stay at home while their superiors believe them to be in the rural areas. It also means they can keep their travel allowances for personal use. One district head with a house in Waingapu said that officers sometimes do not even bother to travel to the villages. They instead come to this house and ask for their travel documents to be signed, meaning that at no time do they even leave Waingapu. The head making this assertion said that people in his position have no choice but to sign these documents. If they refuse it becomes impossible for them to get anything that they may desire through regional government without extraordinary cost and delay.

Returning to other specific limitations of the Agriculture Department's extension service, Fisher (1992b) has identified a number of this service's characteristics which reduce its real assistance to upland farmers. Although not referring especially to the situation in Sumba there is no doubt that Fisher in identifying these limitations is relying greatly upon his ten years of work on the island and as such his statements are directly relevant to Paberiwai's situation. Structural limitations of the service in general include emphasis on research into and promotion of technologies inappropriate to farmers' conditions, preference towards acting on national rather than local priorities and institutional divisions preventing staff members from being flexible enough to deal with problems related to the whole farming system. Characteristics of individual staff members constraining their effectiveness include them often having a different cultural and ethnic background from those they are serving, their preference towards using conceptual rather than practical teaching methods, their accountability to superiors rather than constituent farmers and their unpopularity. The latter arises from connection with a system that, through its policies, marginalizes upland farmers (Fisher 1992b: 5-7).

Therefore, despite the absence of a significant degree of participation in YTN's approach, its programme has had advantages for the people of Paberiwai. By increasing the availability of technical information to farmers via village based extensionists, quarterly meetings and cross visits, YTN has provided a significant service to Paberiwai's upland farmers who have in the past been neglected by the Agriculture Department's extension service. This has allowed farmers to adopt innovations from the programme which are consistent with their desires, such as horticultural and estate trees, with reasonable quality. Due to the provision of technical support these efforts have been better than similar attempts to promote these innovations by government agencies.

6.5 Conclusion

Although YTN has encouraged farmers to adopt the tree legume and terracing technology seemingly against the perceived needs and desires of recipient farmers and hence, in the absence of significant participation, this does not mean that participation is a superfluous component of the adoption process. In the case of tree legumes and terracing, although YTN has encouraged their reception it has been unable to achieve a high quality of adoption. A failure to incorporate adequate recipient participation has therefore, led to much waste and inefficiency as problems farmers have with the technology and its inconsistencies with their conditions diminish their interest. Despite this failure emerging from an absence of participation YTN's programme has still made contributions to the livelihoods of Paberiwai's residents. Creation of a structure supplying technical information to farmers has been useful and has complemented the organisation's attempts to promote horticultural and estate trees. Farmers have, in this instance, utilised the extension infrastructure created because of attraction to this component of the agency's programme. YTN's mixed success thus illustrates that without a significant level of recipient participation its programme has a 'hit and miss' or imprecise character. Selecting technologies according to donor preconceptions rather than farmer desires means that the rate and quality of adoption can be good if the technology chosen happens, by good fortune, to correspond with farmer wishes. It also means however, that the entire programme can be jeopardised if there is no such conformity and inordinate emphasis has been placed on an inappropriate technology.



Plates 19 and 20: Extensive stands of red calliandra, at Pahulubandil, Desa Wanggameti, have been abandoned for about six years. The eight families possessing these stands have preferred to engage in shifting cultivation on the sloping lowlands of Tama.





Plate 21: Abandoned red calliandra at Pahulubandil.

Plate 22: The time and labour required to prune red calliandra has prompted the owner of this garden to prepare a field for planting alongside the stand, rather than in between the rows of trees.





Plate 23: A shifting cultivation garden worked by farmers from Pahulubandil at Tama, Desa Wanggameti. The garden is being prepared for planting again in the wet season of 1993-94.

Plate 24: Shifting cultivation garden at Kapumbung owned by a member of Desa Wanggameti's village elite.





Plate 25: Shifting cultivation gardens owned by farmers of Laibilla, Desa Kananggar. Although they have plantings of red calliandra alongside the main road on the ridgetop, farmers of Laibilla obtain their food crops from these gardens which are not visible from the main road.

Plate 26: This shifting garden in the forest zone below Watubara, Desa Katikuwai, is possessed by a member of the village elite who has extensive plantings of red calliandra at the village's complex at Kawatu.





Plate 27: Although their homes are surrounded by abandoned fields of red calliandra, these women from Laironja, Desa Wanggameti, still prefer to collect fuelwood in the nearby forest.

Plate 28: The people of Laironja also continue to obtain high quality timber from the Wanggameti forest. The availability of this timber negates any attraction people may have to tree legumes for their construction value.





Plate 29: Farmer cutting *hamui* (*Neolitsea sp.*) from the Wanggameti forest. Time can be spent more productively extracting valuable forest products rather than working legume gardens.

CHAPTER 7

EMERGENCE AND ROLE OF FORCE

7.1 Introduction

It has been argued that there is minimal participation in YTN's approach. Participation was initially constrained by preconceptions of individuals in WN as to the most appropriate technologies and by eagerness of high level YTN staff to support these chosen technologies. This support is not surprising because YTN was specifically created to sustain WN's programme and the organisation continues to have a close relationship (in technical and financial terms) with its parent body. Participation was further subdued by reluctance of low level staff and farmers to question the decision to promote the chosen technologies in their current form. This reluctance was added to by farmer perceptions of YTN as a formal body and by the nature of YTN's approach, which relied greatly on peer group pressure. It was then stated that due to the lack of participation, the quality of adoption of terracing (WN/YTN's preferred technology) has been poor. This is because constraints arising from the perceptions and culture of the Sumbanese and inherent in the local environment have gone undetected. Hence, attempts were not made to adapt the programme, in a manner that could minimise their disruptive influence.

While the situation described above is fairly clear, a major peculiarity still surrounds circumstances in Paberiwai. If there was little participation in YTN's approach, and if the planting of tree legumes and construction of terraces was inconsistent with farmer needs and desires (as shown by examination of those needs and the speed with which recipients abandoned the technology), then why were farmers prepared to adopt the technology in the first instance? Why did they even bother to plant tree legumes? Why do Halawala's farmers make huge efforts to continue to intercrop tree legumes even though they get no harvests? Why are farmers in previously unserviced villages still willing to plant tree legumes even though

they have travelled through experienced YTN villages and seen fields of abandoned red calliandra? In section 5.4 underlying reasons as to why WN/YTN promoted the preferred technology were identified. The farmers' perspective is now examined to discover why they were prepared to adopt that technology.

The answer to this conundrum can be found by examining the approach that actually did motivate farmers to adopt tree legumes and terracing. To this point, discussion has focussed on the absence of genuine participation in YTN's approach and the ramifications of this. The following examines what took participation's place and describes how this has been advantageous for WN/YTN and state agencies. Finally, although the use of this alternative approach has made a limited contribution to physical development and virtually no contribution to human development, it will be indicated that it has (together with YTNs programme in general) provided advantages for Paberiwai's ordinary farmers. These advantages are significant albeit unintended.

7.2 Evidence that force is the primary motivator of farmer adoption

7.2.1 Initial indications from farmers that adoption is compulsory

It has been established that farmers did not participate in the selection of YTN's preferred technology and that this technology is inconsistent with their needs and desires. It is therefore contended, that the major reason why farmers in the villages studied adopted this technology is because they were forced into adoption. Of nineteen farmers prepared to respond to this issue in Katikuwai and Katikutana, seventeen said that it was compulsory to make terraces and plant tree legumes. YTN's theoretical approach to the task of encouraging farmers to adopt the introduced technology emphasises no coercion. They acknowledge that this does not secure long term sustainable innovation. Nevertheless, farmers in the study villages feel forced into adopting terracing and tree legumes, perceiving that they have no choice in this

matter. Evidence will be shown to suggest that coerced adoption reaches back to at least the mid-1980s and that it is becoming more common.

The WN/YTN hierarchy are offended at the suggestion that farmers are coerced into innovation adoption. This is understandable given the conflict between this concept and the organisation's stated aims and principles. They argue that farmers come independently and alone to request seed from YTN staff at their homes. This means that they could not have been forced into adoption. Before this request, YTN had merely given private extension to recipients. During this extension nothing coercive occurred. They say sometimes farmers receive no extension and yet still request seed. YTN explains that this stems from a desire for the programme arising from communication with family and neighbours in other villages who are already following the organisation's activities (Yayasan Tananua 1993: 13,18).

In constructing these defences however, YTN fails to acknowledge that the actions of its staff and of farmers' neighbours and family are not their only sources of motivation. There is pressure to follow YTN activities from the state as well, particularly from local government but also from district and regional governments and from the policies of national government departments. Two pressures motivating farmers that emanate from the state, are a threat of violence and a threat of being relocated from their villages and the mountains to the coast under local transmigration projects. The threat of violence comes from the local government in conjunction with the local elite. The threat of being relocated comes from a policy of the central government that is implemented by agencies at the district and regional level. A summary of coercive means used to get farmers to adopt the technology and the central role of local government in this, is provided in Table 7.1. This table shows the results to the open-ended question of why those farmers referred to above felt that adoption of tree legumes was compulsory.

Table 7.1 - Reasons given by farmers in Katikuwai and Katikutana as to why they MUST plant tree legumes

Reason	Percentage of Respondents	Number of Respondents
If don't plant we will be relocated	29.4	5
Village government says so	29.4	5
Village government is angry	23.5	4
Village government beats us	11.8	2
To get horticultural trees from YTN	5.9	1
Total	100	17

The number of farmers responding with regard to the existence of force is obviously not great. Only a small number of respondents were asked directly whether it was compulsory to plant tree legumes because for much of the data collection period it was not realised that coercion was a factor in promoting initial farmer adoption. The role of coercion and force in motivating farmers is never mentioned in YTN's written reports, nor was it discussed in preliminary discussions with staff. All sources of information initially referred to, merely reiterated the notion that a participatory approach was dominant. Thus, background analysis did not reveal force's existence. This meant it could not be investigated via specific questions in the initial question schedule. Due to the inherently sensitive nature of the issue it was also not brought up by ordinary farmers for a considerable length of time, until it happened to be referred to during the discursive part of an interview with a woman at Katikuwai in July 1993. It is accepted therefore, that these data do not conclusively support the notion that the majority of adoptions in YTN-following study villages resulted from force.

Nevertheless, although the number of respondents on this issue is small and therefore the actual importance of force inconclusive, the responses from these farmers remain an indicator of the occurrence of some adoption motivated by force in the study villages. Furthermore, the possibility that force had a *central* role in motivating adoption throughout the study villages is not weakened by the lateness of its identification by the researcher. An inability to discover the existence of force at an earlier date does not argue against the permeation of force throughout the study villages. As inferred above, it is a result of the issue's sensitivity and

the reluctance of many individuals to talk about it; especially if they believe the researcher is unaware of its existence or maybe disapproving of its use (perhaps the case with YTN staff who have a more experienced knowledge of foreigners' tastes). Moreover, the influence of force no doubt varies amongst villages and little time had been spent in those villages found to be most subjected to force until the middle of the data collection period. Indeed rather than being unfortunate to have discovered the existence of force until roughly half of the time in Sumba had passed (unfortunate in the sense that fewer respondents could be interviewed directly on the issue), it was fortunate that the research method allowed this sensitive issue to have been uncovered at all. Luckily, the interviews were sufficiently unstructured and non-intimidatory that the female informant, who had been pressured to adopt, felt adequately comfortable to express her experiences. A more structured or business-like and less sensitive approach may have meant an awareness of force's existence was never achieved. Lack of awareness on the part of the researcher however, would not have affected its existence.

7.2.2 Key informants say adoption is forced via physical and mental coercion

The sensitivity of motivation by force meant that even after its existence was known, asking farmers about it in semi-formal interviews sometimes led to discomfort for both the interviewer and interviewee. Consequently, the issue was pursued with key informants and in Ramuk was investigated using totally informal and qualitative means. Therefore, the centrality of force in motivating adoption in YTN-following study villages does not rely for support merely from farmers interviewed but also from testimonies of key informants who spoke about this issue both after being approached and without prompting. As many of these people are responsible for implementing force their statements are reasonably reliable. This reliability is crucial in providing conclusive evidence of force's importance.

Village government officials were amongst key informants saying (without prompting) that recipients were forced to follow YTN's programme. An official from Pinduwatu, Katikutana,

said proudly that everybody in Pinduwatu made terraces and planted tree legumes. When asked how this had been achieved, he replied boldly that if farmers did not want to follow then they were forced to do so ("*dipaksa*"). Similarly the Dusun head of Laru in Katikuwai when asked why he was not maintaining his red calliandra replied that he only planted the trees in the first place so that everybody else would be afraid and also plant them. He could use his planting of legumes as a basis to become angry with farmers if they did not follow his example.

Although a sensitive issue, many government officials, like those mentioned above, are not shy about revealing their methods. This is because local government's use and threat of violence and other methods of coercion is not confined to efforts to promote tree legumes and terraces. According to farmers it is government's historical and standard approach when motivating village people. Farmers give innumerable examples supporting the idea that there is a tradition and background of coercion. In Katikuwai it is alleged that the village head and his staff go on household inspections and physically reprimand those farmers who have not heeded their instructions, the most recent being to maintain clean housegardens and plant more trees. Similarly, in Praimbana a farmer was struck by a district official during an OPSUS inspection for failing to remember how many chickens there were in his community. In addition to using physical intimidation local governments use emotional coercion. In Katikuwai many farmers say that they take part in reforestation activities (funded by the World Food Programme and the Forestry Department) rather than cultivate fertile *Chromolaena* lands because the village government implies that those who do not participate are not interested in their village's development. Although participation was supposed to be voluntary, many of those asked to take part did so because if they refused there was ill-feeling ("*perasaan tidak enak*") with the local elite. Hence, familiarity of some members of the local elite and government with coercion, established via its use over time, means that they can also talk about this phenomenon with reasonable candour. This history of coercive motivation also means that when the local elite and government pressure farmers into adopting YTN's technologies they are more likely to achieve results. Farmers recognise that anger and threats from village officials are not hollow but real.

This supports the notion therefore, that force could have a central role in promoting adoption in the study villages.

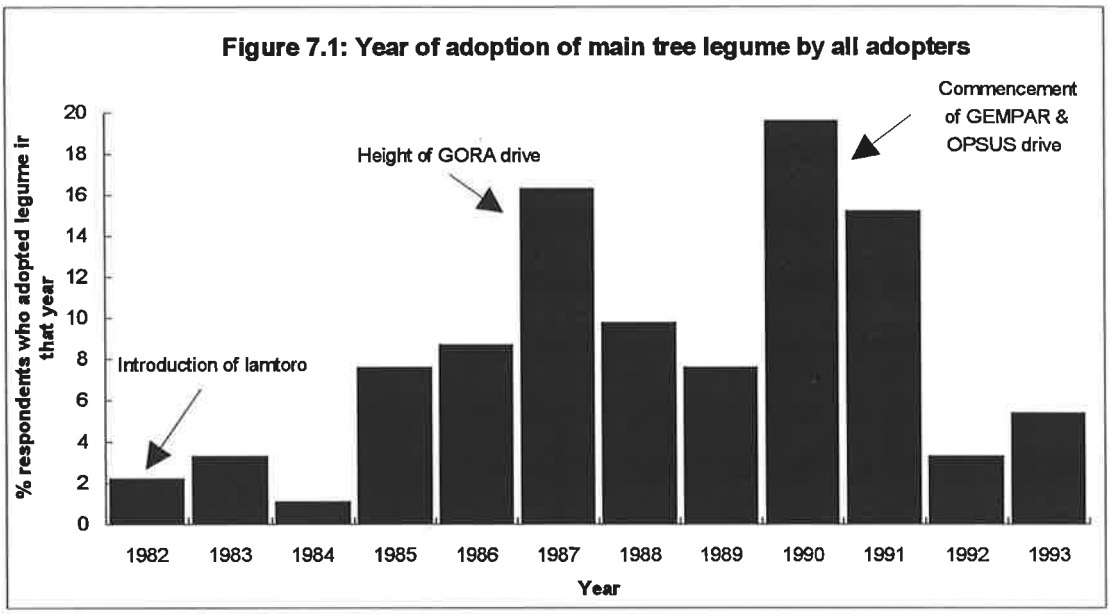
7.2.3 Correspondence of forceful government programmes with adoption peaks

Further evidence that, in the study villages, adoption of YTN's tree legume and terrace technology was related to force emanating from the elite and government, arises from correspondence between the introduction of forceful government programmes into villages and the adoption of YTN's preferred technology. In Halawala, Wanggameti, and Kalimbuwai, in Katikuwai, numerous farmers said that they first planted tree legumes in the same year as they planted GORA rice. They said that from 1985 to 1988 they planted GORA rice in the same fields as they planted red calliandra. As described in Chapter 6 it was compulsory for farmers to follow the GORA programme. Soldiers, whose presence was aimed to exert pressure, assisted Agriculture Department extensionists in disseminating the technology amongst farmers. Introducing its state approved technology at the same time as the GORA programme was being implemented, would have assisted adoption of YTN's technology, as it could ride the wave of coercion generated by the state. The likelihood that farmers were coerced into the adoption of both technologies is supported by the passive reasons farmers at Halawala gave for adopting the technologies. They said that even though they had seen neither of these two technologies before, they adopted them because they trusted that if formal organisations were involved in their promotion then they must have been tested and found to be advantageous for farmers.

Existence of a general connection between the rate of adoption of YTN's technology in the study villages and major government programmes is shown in Figure 7.1. This figure supports the comments of farmers recorded above. The notion that farmers in Wanggameti in particular, were motivated as a result of YTN's entrance coinciding with the implementation of the GORA programme is further supported by Table 5.15 of Chapter 5 (from which Figure 7.1 is derived). Table 5.15 shows that in this village during the height of the GORA programme's

implementation from 1986 to 1988, 61 percent of farmers currently possessing the tree legume technology first adopted it at that stage.

Figure 7.1: Year of adoption of main tree legume by all adopters



In 1989 as the impetus of the GORA programme receded there was also a decline in the rate of adoption of YTN's technologies, in the four YTN-following study villages. In the early 1990s however, those farmers who had not yet adopted were placed under pressure from new government programmes. These programmes, as well as having their own goals, also promoted YTN's technology.

Two government programmes could have contributed to the peak in adoption rates in the study villages in the early 1990s and the recent rapid expansion of YTN's preferred technology in new villages throughout Sumba. These are the GEMPAR and OPSUS programmes. The GEMPAR programme (*Gerakan Meningkatkan Pendapatan Asli Rakyat*) came to Paberiwai in 1990 with the general aim of raising people's incomes. This was to be done by developing integrated farming systems which could produce crops, livestock and handicrafts for export (Fernandez H. 1991: 10). However, this aim was the extent of the GEMPAR movement, it was more a policy than a programme. It did not provide any materials to either farmers or officials nor did it suggest any new technologies. It was merely a policy from provincial

government emphasising at what existing institutions with their available resources and technologies should aim. It nevertheless, demanded results. Consequently, because YTN's preferred technology could contribute to the development of integrated farming systems, government officials at all levels saw it as their responsibility, under the GEMPAR initiative, to promote YTN's programme using their standard method of motivation.

Formally introduced in September 1992, the East Sumba regional government's OPSUS (*Operasi Khusus Pahamu Nduma Luri* or special operation to improve rural livelihoods) would also have contributed to some of the most recent adoption of YTN's technology in the study villages. Its introduction could also explain the technology's rapid spread into new villages, which has seen the total number of YTN-following villages double in a very short time. The signficance of OPSUS comes from the fact that, unlike GEMPAR, it is not only a policy but provides funding to allow government officials to travel to villages to give extension and engage in motivation. In Paberiwai, it funds five groups of ten officials from village and district government to tour farmer households. These officials include village heads, extensionists from various agencies and soldiers. They notify farmers of innovations that must be adopted and changes that must be made in their households.[1] They then take an inventory of current possessions and conditions. After a period of time the inspecting group is to return to each household and ensure that the instructions have been carried out. Failure to heed instructions leads to farmers incurring verbal and physical retribution. These teams place greater pressure on farmers to adopt YTN's technology in two connected ways. First, government officials often use visits as an opportunity to promote YTN's technology. This promotion results from these officials regarding it as their responsibility to promote any programmes that have been formally sanctioned by the state. It also results from YTN's technology being favoured by officials for various individual, occasionally political, reasons. Second, the OPSUS has increased pressure on

[1] Formal instructions that farmers must execute for the OPSUS involve each household, 1) living in a separate dwelling, 2) moving to certifiable land by a main road, 3) planting 15 or more estate or horticultural trees per year, 4) increasing the amount of land that they cultivate, 5) helping to make roads between the village and district capital, 6) increasing their children's participation at school, 7) improving health conditions, 8) assisting in the reduction of livestock theft, and 9) moving to a resettlement site outside of the uplands if they have less than 0.5 Ha of certifiable land.

farmers to adopt YTN's technology (as well as the requirements of other programmes) because of the increased frequency and rigour of inspections under this initiative. Although it is a relatively new scheme, and many farmer households are yet to be visited, there is already a great awareness amongst farmers of the inspections, requirements and methods of the OPSUS. This awareness has originated from the warnings of local government officials. The reputation of the programme has therefore, preceded the arrival of officials and has already encouraged fearful farmers to commence conforming so as to minimise the wrath incurred when the teams do arrive.

7.2.4 Resettlement as a major factor in forcing adoption

Farmers in the study villages are immensely concerned by the threat of being moved out of their homes and the uplands of Paberiwai altogether, to a relocation settlement at Kakaha on Sumba's southern coastal plain. This threat has had a major role in motivating farmers to adopt YTN's technology in the study villages, particularly in the early 1990s. It has been argued that farmers should be moved to prevent them degrading the forest.[2] In most villages the threat of relocation for this reason only concerns those living in or near the forest zone. In Katikuwai, Katikutana and Wanggameti however, the majority of the population fears they will be moved. They fear current forest zone boundaries will be expanded to include their entire villages, leaving them with nowhere to go except to a resettlement site. That the threat of resettlement is significant in motivating adoption of YTN's technology is supported by the following:

i) farmers are certain that a move is likely;

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[2] Observation of usage of the important Wanggameti forest in particular, suggested that resettlement may not assist its long term preservation. Although at present much degradation results from the activities of locals, particularly of shifting cultivation and burning of the grasslands leading to degradation at forest edges, there is evidence to suggest that moving local people out would merely expose the forest to damage from those living further away. At present forest products (timber and non-timber) are taken from the Wanggameti forest by residents of Praibokul. It is easy to envisage that Praibokul's residents (who will not be resettled because of their village's vast wet rice fields) will intensify their use of the Wanggameti forest if the local population is moved, as this will make more forest resources available to their exploitation. Such utilisation will also be attractive because of the severe degradation of Praibokul's forest and the greater number of trucks now linking Praibokul with Wanggameti. These issues and better methods for conserving forest areas are discussed in Lee (1994).

ii) the detrimental consequences of such a move means that they would do anything to avoid it;
iii) farmers believe that following YTN's activities will help them avoid relocation.

Threats of relocation have been mooted in the study villages since the 1960s. It is only recently however, that farmers in Katikuwai, Katikutana and Wanggameti have actually thought that they would be executed. This is due to the strength of communications from government to farmers, asserting that all residents of these villages will have to move. The seriousness of these threats first became apparent when a convoy of regional government officials, representing seven different departments, arrived at the house of Katikutana's village head. They said that the whole village would be relocated to Kakaha commencing with the community of Wairunu. Social workers were stationed in the village to prepare the population, farmers were taken to see the resettlement site, and they were told frightening tales of what would happen to those choosing to remain. By late 1994 the movement of all residents from Wairunu had been completed. Therefore, due to the strength of this most recent notification that resettlement would occur, accompanied by its actual implementation in Wairunu, farmers in the three villages concerned truly believe that this time the threat is serious and actual.

Resettlement greatly concerns residents of the study villages because it has numerous detrimental consequences for them. In spiritual terms, leaving their ancestral homes, graves and lands, is an enormous burden for all Sumbanese. It is especially damaging to the faith of those still practising the *Marapu* religion.[3] There are also significant economic costs associated with abandoning these possessions. Leaving their land means abandoning established tree gardens (dominated by areca nut) and the sites from where they collect forest products. This means losing two valuable sources of income. Similarly *Marapu* houses and tombstones not only have a spiritual value but are symbols of status that are enormously expensive to establish. The building of a traditional *Marapu* house requires the sacrifice of livestock at all stages of construction from the felling of trees for timber to their erection in the dwelling. The collection

[3] BANGDES (1992) indicates that formally, people of *Marapu* faith constitute 35 percent of Katikutana's population and 28 percent of the people throughout Kecamatan Paberiwai (informally it is expected that the number of *Marapu* believers is greater).

of a large tombstone in Meorumba required the family of the deceased to provide pork and beef three times a day for four days to the more than 500 men who dragged it from its quarry site.

Resettlement is also economically disadvantageous because it requires the Sumbanese to surrender the traditional system of social security protecting them against famine in the hungry season. At present, when individuals deplete their food resources they go to others in their community to request food (*mandara*). The food requestor often gives some areca nut or other product to the food giver but its value is substantially less than that of the corn or rice provided. Furthermore, such exchanges are not imperative and food givers feel compelled to give food to those requesting it because in the future they themselves may need to *mandara* (and they normally do, having given their food to others). They are also sympathetic to food requestors because they often have a family relationship. It sometimes happens that everybody in a single community has no food; in this situation farmers rely on their numerous family connections with the people of other villages to *mandara*. Those threatened with resettlement therefore, worry that distance will isolate them from their family in other villages who remain in the uplands or who have been relocated to completely different areas, thereby endangering their food security in times of hunger. Relocating upland farmers would also isolate them from forest yams (*iwi* or *Dioscorea hispida*), their other major food source during hungry times. Forest yams are a substantial resource to the people of Paberiwai being found throughout the district in small pockets of secondary and degraded forest.[4]

People in the three study villages around the Wanggameti forest are also nervous about being moved to the lowlands at Kakaha in particular because this involves residing in a different traditional kingdom. East Sumba's contemporary Kecamatan (district) divisions, are based on

[4] It should be noted that resettlement does not only represent disadvantages for those being moved, but for the people remaining *in situ* as well. In the village of Meorumba the resettlement project involves the relocation of people living in the forest zone but allows those not in the zone to remain where they are. These people remaining *in situ* will be disadvantaged by losing family from whom they currently *mandara*, by losing a source of purchasers to whom they occasionally sell goods, and by being left in a village which is so small that it may be absorbed into a neighbouring village. The occurrence of the last of these disadvantages would see those people remaining in Meorumba getting a smaller proportion of, and having less control over, the development funds awarded to every village by the regional government.

traditional kingdoms. As indicated in Chapter 4, Kecamatan Paberiwai is based around the mountain kingdom of Mahu, while Kakaha is located in the kingdom of Karera. Historically, Mahu and Karera were allies in battles against the kingdom of Tabundung. At other times however, the people of Mahu (especially those from Laironja) raided the people of Karera, murdering and pillaging (Kate 1894: 567). This history, together with modern stories about the inhospitable treatment which previous settlers from the mountains have received from lowlanders (having livestock slaughtered and houses burnt), has made many uplanders understandably reluctant to move to this kingdom.

The seriousness of the consequences of resettlement for farmers from Paberiwai supports the notion that they would be prepared to do anything to resist it. One of the primary reasons therefore, why farmers in the study villages have adopted tree legumes and terracing is to avoid resettlement. Farmers themselves have come to the conclusion, and others have made it clear to them, that adoption of YTN's technology is one way that they can avoid leaving their villages. Farmers realised that planting trees helps avoid resettlement by observing situations such as occurred in Maukarohu, Praimbana. In this instance the people of Maukarohu were absorbed into the forest zone and were facing relocation. The Forestry Department took into account however, the number of trees (especially areca nut and coffee) and the large area of wet rice that farmers possessed and decided that they could remain. That is, farmers were rewarded for having trees.

It is more common however, that others indicate to farmers that planting tree legumes from YTN helps stave off relocation. Indeed, government officials' statements imply to farmers that the decision as to whether they will be relocated, hinges on their adoption of YTN's programme. Recently for example, in Katikutana, the head of SOSPOL (branch of the Indonesian government attending to socio-political security), who originates from Paberiwai and is highly respected by locals, travelled from Waingapu to say that those living outside of Wairunu need not worry about being relocated. On the condition that they followed YTN's programme, made terraces and planted tree legumes, they could remain in Katikutana.

Promotion of YTN's technology by regional government was then further enhanced when it held a three day agricultural workshop in Katikutana which emphasised again making terraces with an A-frame and planting those terraces with tree legumes. Before the threat of relocation became serious in Katikutana YTN's reception was restricted to Pinduwatu and a few farmers at Tana Pingi. Within a matter of months after promotion from regional government, adoption had intensified in these regions and spread to the communities of Handula and La Au.

In Katikuwai the notion that following YTN's technology was a prerequisite for avoiding relocation was also expressed by government officials. On this occasion the village head and traditional leaders told farmers that there was a regional government policy stating that all residents of Katikuwai, Katikutana and Wanggameti who did not work certifiable land and make terraces would be relocated to Kakaha. Apparently this directive had been relayed to village government by district officials attending the village during an OPSUS inspection. Similarly, in Lakombu, Meorumba, traditional leaders convinced other residents that they should follow YTN's programme, upon realising that the community had been included in the forest zone and designated for resettlement. These leaders openly expressed their intention to adopt the programme so that they could use it as one reason why they should not be moved.

Threats emanating from government that force farmers to adopt YTN's technology are often inter-related. Sometimes farmers do not perceive the danger of being moved and so carry on with traditional behaviour. The village government and elite however, who are also members of the village, are more likely to be aware of such threats and are often concerned that their village will be moved or worse, broken up. This would lead to them losing their privileged positions as leaders because their subjects would be dispersed. In these circumstances, village government or the elite request YTN's technology and then force ordinary farmers to adopt it with threats of physical violence. This defends the village from relocation and preserves their privileged positions.

7.2.5 Absence of better explanations for the nature of farmer adoption supports the primacy of force

Finally, support for force's central role in encouraging farmers to adopt YTN's preferred technology is provided by an absence of alternative explanations which fit with the nature of adoption observed. As stated in section 7.2.1, YTN argues that farmer attraction to tree legumes and terracing comes from communication with family and neighbours in other villages and observation of their fields. However, WN/YTN's long held belief that this is the cause of adoption has been based on mere assumption, and a handful of statements from individuals employed as their own extensionists. They have never objectively investigated nor provided substantial evidence that this communication is truly influential. They have also never disproved the possible influence of forces acting upon farmers from the state. In fact, they have never considered the possibility that these forces could be influential.

The assertion that communication with family and neighbours promotes adoption of YTN's technology is also weakened by its inconsistency with the characteristics of adoption observable in Paberiwai. Basing interest on communication with those in other villages relies on the premise that farmers are impressed by examples of the technology that they witness in these villages. In reality however, there are very few good examples of use of the tree legume and terrace technology that could make such impressions. At the end of 1993 most YTN staff did not have gardens, let alone productive ones, and in study villages the majority of hedgerows were abandoned. Moreover, according to recipients and YTN extensionists in the study villages, hedgerows had not significantly increased agricultural productivity, were not preferred fuelwoods and were not optimal shade trees. Hence, even if one leaves aside data saying that tree legumes are less consistent with farmer needs and desires and that one would expect them to be more interested in other tree types, there is no outstanding reason why farmers would want to adopt this technology if exercising their own free will. The only proven value of tree legumes and terracing at present, is in avoiding relocation and the wrath of officials.

Another characteristic of adoption suggesting that force was a primary factor encouraging farmers to adopt the technology, rather than the exercise of freewill inspired by communication with friends and neighbours, is the manner in which the technology has recently been received into new villages. As stated in Chapter 4, as a result of the WN/YTN method, the organisation expects that around five to ten households only will adopt the technology in a newly entered village in the first year. This is supposedly because YTN deliberately restricts the number so that only those genuinely interested take part and so that the consequences of any failure are less. In reality however, the number of households following the programme in its first year in villages that have recently joined the movement is significantly greater than that planned. Referring back to Table 5.1 of Chapter 5, in villages newly following in 1992 an average of 36 households were included in the first year and of those newly following in 1993 an average of 53 households were included. Moreover, representations made by seed requestors at the Pinduwatu quarterly meeting indicate that in many instances these large numbers of households all originate from just one or two communities in each village. Therefore, all members of a community are joining the programme at once in its first year of operation. A pattern of adoption of this kind is more easily explained by whole communities being forced into adoption. It is highly improbable that all members of a community would all choose to follow the programme in its first year if the decision was left to freedom of choice.

7.2.6 Summary of evidence establishing the primacy of force

Numerous forces act upon farmers motivating them to adopt YTN's preferred technology. First, almost all of nineteen farmers directly interviewed said that it was compulsory to follow YTN's programme. Second, key informants, essentially government officials themselves, stated that they forced farmers into adoption via physical and mental coercion. These claims are believable because such means are historical, common and widely accepted methods of motivation not only in Sumba but throughout Indonesia. Third, peaks in adoption correspond with the entrance of forceful government programmes into YTN-following villages.

Key persons said that as a part of these government programmes the officials involved often promoted YTN's technologies also. Fourth, resettlement has been perceived by farmers in the study villages to be a major threat. There is a strong reason to believe that farmers would be willing to do anything to resist this resettlement because of its disadvantageous consequences. As it has been asserted to farmers by trusted sources that failure to adopt YTN's technology will result in certain relocation, it must be concluded that this has been a significant factor motivating adoption. Fifth, the nature of adoption observable in the study villages can only be explained by the dominance of force in motivating adoption. YTN's common explanation why farmers adopt the technology breaks down because genuine advantages of tree legumes (other than staving off resettlement) have not been demonstrated anywhere. Moreover, a tendency for all farmers in one community to adopt at the one time suggests that pressure to conform dominates over farmers' freedom of choice.

Although few specific data were collected as to the number of farmers directly motivated to adopt YTN's technology as a result of force (a difficult aim anyway given the sensitivity of the issue for ordinary farmers), it is nevertheless evident that pressure to adopt the technology permeates the study villages. It is thus concluded that force had a major role in encouraging much adoption. The inherent natures of coercive approaches, forcing farmers to adopt, and participatory approaches, which let farmers exercise freedom of choice, are logically mutually exclusive, with coercive approaches necessarily dominating. Farmers cannot make up their own minds when there are coercive pressures insisting that they adopt.

7.3 YTN's contribution to the emergence of a force approach

7.3.1 Role of YTN in encouraging state involvement and hence, a force approach

Farmers initially adopted YTN's technology due to two major threats, one of physical violence and the other of being relocated. That local government should use such threats to

promote a new technology is not surprising given their background and traditional use of this approach for all purposes. However, that YTN could tolerate the exercise of such an approach is surprising. If they aim to enhance farmer participation and use and create an example of a participatory approach, why do they allow the state to use a force approach so obviously incompatible with their own principles, that necessarily dominates? If farmers are forced to adopt an innovation out of fear they will not feel confident to espouse problems that they are having with the technology. It may be that YTN cannot do anything about state involvement and its use of force. If the state has decided to promote the tree legume and terrace technology for whatever reason, using its preferred means, then YTN is powerless to stop them. In this situation YTN would be blameless as it was overcome by the forceful and coercive traditions of the authoritarian state in which it was operating.

YTN however, has not been passive. It has contributed to the dominance of force through its desire to collaborate with and seek the support of the state while introducing its preferred technology. The state has therefore promoted YTN's technology as a result of YTN's own policy and with the organisation's consent and encouragement. Nevertheless, was it a misdeed for YTN to seek government involvement, and was it foreseeable that this involvement would lead to the decline of their participatory approach and the dominance of force? In relation to the first part of this question, development theorists and practitioners widely hold that, due to the continued strength of local leadership in the villages of East Sumba and NTT generally, agencies setting up any kind of development programme in these villages must seek approval and support from both government officials and traditional leaders (Forth 1981: 226, BAPPEDA and Lynch 1988: 8, Barlow and Gondowarsito 1991: 23, Datta 1993: 7, 46). However, to merely smooth the path of its programme into the village environment it was unnecessary for YTN to establish the intimate collaboration evident. There is a difference between getting approval from local leaders so that a project may proceed unimpeded, and actually making use of these leaders' traditional powers to promote a project's aims. It is admitted however, as will be discussed in Chapter 8, that it may be difficult to communicate these different approaches to leaders and hence, to separate them in practice.

With regard to the second part of the question it was not necessarily inevitable that intimate collaboration with the state would lead to the dominance of a force approach. As stated in Chapter 2, collaboration between NGOs using participatory approaches and state agencies less familiar with these methods can actually create an example for the latter which can stimulate them to effect institutional reform. In this situation however, the NGO did not lead to institutional reform nor did it deter either the state or elite from using force. This was due to the type of collaboration encouraged by YTN. In the study villages, YTN made few efforts to expose village government officials and traditional leaders to participatory methods. Instead from the moment YTN entered these villages it sought these individuals' active involvement merely in motivational roles in order to direct any power that they possessed towards increasing the rate of farmer adoption. As village motivators from the elite (called by YTN "*pendorong*") were given no extension as to preferred motivation approaches they naturally used the traditional coercive method familiar to them.[5]

In Pinduwatu for example, YTN's farmer extensionist told the RK head (*Rukun Kelompok*; hamlet) that he wanted him to act as a motivator for YTN's programme. The RK head agreed; his method of motivation was to decree that every household had to make terraces and plant a minimum of two new legume hedgerows per year or else suffer the consequences. The YTN staff member therefore, actively sought the assistance of a local official. If YTN's aim was merely to ensure they did not clash with village government it would be unnecessary to get leaders to take up active roles in motivation. The importance attributed to

[5] In addition to uncontrolled government assistance leading to the use and dominance of a force approach there are other problems associated with requesting the help of the state and village elite in this manner. First, YTN's seeking out and utilising of this source of village power without modification means that the organisation is effectively recognising and validating this leadership and its dominant method of motivation. Other risks in using local leadership include there being no guarantee that these local leaders have the best interests of ordinary farmers at heart. In relation to Forestry Department reforestation projects it was observed that village leaders often used the powerful roles they were given in these programmes to exploit ordinary farmers. In Wanggameti a village leader acting as the head of a ten-household working party in a reforestation project cheated others in his group by getting them to plant 1.2 hectares per group member while they believed they were planting just 1 hectare per person. This meant that at the end of the work an additional two hectares had been planted for which the village leader received the entire payment, in addition to what he was entitled to as a member of the group. In Katikuwai, another village leader given a role as distributor of rice payments to farmers working on reforestation projects, kept for himself almost half of the rice due to a particular poor farmer, on the alleged basis that the poor farmer had debts owing to him from previous years. This was disputed by the poor farmer but he had no recourse to get his rice back once it was in the leader's hands.

and reliance upon the force approach of local officials is illustrated by a senior YTN extension officer who blamed the slow spread of the programme in the village of Mehangmata on the village head. This was because that village head only inspected farmers' gardens once a year and did not organise regular village meetings to assess conditions and provide guidance.

It was foreseeable that if the village elite were given major motivation roles without being trained in alternative approaches to this task, that they would use the coercive methods of motivation with which they were most familiar. In this sense, although not deliberately advocating the use of force, YTN contributed to the dominance of this type of approach through its policy of involving the village elite in their programme's promotion.

7.3.2 Traces of force in YTN's approach and in the actions of individual staff members

Most pressure acting upon farmers to adopt YTN's preferred technology has come from government and the local elite. YTN nevertheless, has contributed to the emergence of force by encouraging its cadres to collaborate with state agencies without adequately training them in, nor ensuring that they would use, less coercive means. Although most of the pressure placed directly on farmers comes from government and the elite, YTN also, through its own interactions with farmers, places some coercive pressure upon them. This pressure, exercised unwittingly perhaps, results from the organisation's principles and from the behaviour of individual staff members.

Two examples of the pressure YTN's approach exerts upon farmers have already been cited. First is the manner in which, in some circumstances, YTN has threatened to withdraw from villages, such as Wanggameti, that are not adhering to the principles YTN establishes for the adoption of technologies. The second form of coercion previously referred to is peer group pressure generated by YTN's extension apparatus, demanding that farmers adopt the preferred technology. Another characteristic of YTN's approach that tends to force farmers into planting

tree legumes and making terraces is its method of resource distribution. In effect, YTN uses farmers' strong desires to plant horticultural and estate trees, and to a lesser extent trees for timber, to force them into planting tree legumes. It is an implied condition of receiving horticultural and other trees that one has already planted tree legumes and made terraces. YTN's hierarchy insists that no such condition exists. Testimonies of key persons and farmers however, suggest that such a condition is widespread in YTN-following study villages. A former village head of Katikutana said that fruit trees could not be requested unless one had first made terraces. This was supported by other farmers who said that they received cocoa trees because of the high quality of their terraces. Although YTN has no principle directly relating to this matter, another principle has been used by extensionists to give the effect reported by respondents. YTN principle does state that distribution of trees is not supposed to be even but selective. In the words of a YTN cadre, horticultural and other valuable trees are given to farmers demonstrating an ability to 'work hard'. This ability is assessed by observing trees already planted (tree legumes because that is all that YTN is initially prepared to give). Those whose trees are 'well maintained', which in practice means 'planted', get preference in receiving more trees. If farmers have never received any trees from YTN they do not get fruit trees because there is no evidence of their ability to work hard. They must commence from the beginning of the programme. This means they are encouraged by YTN to plant tree legumes.

In addition to pressure on farmers from YTN's approach, there is also evidence that individual staff members are adopting coercive attitudes to promote adoption. Although the effect is the same, this phenomenon is of greater concern because it illustrates some YTN staff have decided force is valuable and are using it with intent. It is easy to accept that the coercive effects of YTN's principles may not be known to individuals within the organisation but if some staff members are adopting an attitude more akin to their counterparts in the government and village elite, this indicates a conscious use and acceptance of force. As an example of staff members adopting a forceful attitude, a farmer extensionist's wife said that many people in their community did not like tree legumes because they thought the trees used up soil fertility (reduced the "*minyak tanah*"). In response to this her husband refused to give them horticultural

trees and openly castigated them. Nevertheless, although isolated instances were reported of YTN staff members expressing their anger towards farmers who refused to do as they wish, in none of the study villages was it said that YTN staff themselves resorted to physical violence.

Most pressure acting upon farmers to adopt YTN's technology is exerted by the policies and officials of government and by the village elite. YTN has contributed to this by its valid desire to collaborate with members of these groups and by its negligence in failing to ensure that officials and leaders invited to take up central roles in farmer motivation, were adequately trained in non-coercive means. In the absence of such training, it was foreseeable that these leaders would rely upon methods that they have used historically. This resulted in YTN losing the opportunity of using collaboration to create an example of alternative motivation methods that could stimulate reform in traditional and state institutions. YTN also contributed directly to a small part of the pressure acting on farmers by insisting that they plant tree legumes and make terraces. Much of this force originates from the structure and principles of YTN and thus, does not result from the deliberate intent of staff members to exert pressure. There are isolated incidents in YTN-following study villages however, of individual staff members consciously using coercive means to achieve adoption of the organisation's preferred technology. These incidents do not imply that the deliberate use of force by YTN staff members is widespread throughout East Sumba. It indicates however, that some members have found this method attractive even though they are aware of the organisation's preference for a participatory approach. For some YTN staff to knowingly subvert the organisation's emphasis on participation suggests that collaboration with government and traditional leaders, rather than leading to reform in these institutions, is actually resulting in change in the attitudes of YTN staff. YTN is not creating an example for government but the force approach of state and traditional insitutions is acting as an example for and stimulating change in the attitudes of some YTN staff members.

7.4 Interdependency of state, elite and YTN interests in using and tolerating force

Farmers initially planted tree legumes even though they are inconsistent with their needs and desires because they are forced to adopt them by members of government and the village elite. This use of force has been tolerated by YTN and has in fact been facilitated by their approach. It has also become an increasingly attractive approach for individual low level staff members in some locations in the study villages. Identification of force's primary role in motivating adoption however, raises a number of additional questions. The most immediate of these is why the local elite and various levels of government are prepared to promote YTN's programme? Similarly, even though YTN may have been naive in collaborating with government initially, why has the NGO continued to seek government assistance and tolerated its use of force even after the nature of these methods became apparent? Moreover, why have some individual staff members been attracted to a force approach even though they realise this subverts the organisation's aims? The argument that force is responsible for adoption of YTN's preferred technology also leads one to question why a force approach has only led to the adoption of tree legumes in the manner observable and not resulted in either higher quality adoption or the adoption of additional innovations? If farmers have been forced to adopt tree legumes, why do they abandon them without fear and continue cultivating traditional gardens in the forest zone? Additionally, why is the force exerted upon farmers not used to get them to leave the forest zone? Revealing the interdependent nature of state/elite and YTN interests helps explain why farmers are not afraid of abandoning their legume gardens and why they are not, and probably cannot be in the future, forced into reopening these gardens.

7.4.1 Reasons for YTN's growing tolerance of and dependence upon force exercised by government and traditional leaders

YTN has tolerated and become increasingly dependent upon the use of force by the state and elite in the promotion of tree legumes and terracing, even after becoming aware of its

use. This is because the organisation gives priority to this technology's success and it cannot be promoted by participatory means due to its inconsistency with farmers' needs and desires. It may be consistent with the needs of the environment and it may be the best technology for farming in the prevailing conditions but farmers have found it less attractive than traditional activities. As stated in the assessment of participation, even though tree legumes and terracing are unpopular amongst farmers YTN has persisted in their promotion because the organisation was formed with a bias emphasising preservation and progress of the rigid programme created by WN. This programme has as its centrepiece the development of tree legume terraces so that they can be allowed to fulfil their potential in increasing agricultural productivity. YTN has given more importance to physical development than human development and so it has tolerated the use of force as a means of achieving its primary goal.

YTN's rigorous adherence to this one technology which has led to it becoming increasingly tolerant of and dependent upon force originates primarily from its relationship with WN, its parent and donor organisation. As stated, WN was responsible for deciding the initial technology introduced without participation from local people. This established a belief amongst YTN staff that this technology's future was more important than farmer thoughts and welfare. Even though ten years have passed since WN first developed the programme and vested responsibility for its welfare in YTN, their relationship has remained very close. As established in Chapter 4, YTN remains highly dependent on WN for technical advice and for more than 80 percent of its funds. This level of dependence, and assessments by WN representatives that are necessitated by it, makes YTN conscious of engaging in activities which appease WN. This is responsible for their continued conformity to WN's desires, even though the programme was conceived more than a decade ago.

WN's responsibility for contributing to YTN's tolerance and dependence upon force also stems from their assessments of YTN's activities. These assessments have at times lacked rigour. This has meant that the promotion of YTN's preferred technologies through force has gone unnoticed, and it has actually allowed YTN and individual staff members to accumulate

prestige on the basis that adoption has been achieved via a participatory approach. In reality, the work has been done by force. Assessments by WN representatives are generally short. The last major assessment by World Neighbours of YTN in 1991 visited four villages in four days. As a result they generally only see a small number of gardens. These gardens are usually owned by paid extensionists or by those living close to the extensionist. The latter's gardens are reasonably maintained because of extra pressure to conform being exerted on their owners. Similarly, the 'farmers' met during these assessments are usually extensionists or village leaders who have vested interests in the future welfare and continuation of YTN and its programme. If ordinary unpaid farmers are met it is normally in the presence of extensionists or village leaders. Consequently, feedback received is constrained and generally reinforces the notion that YTN is adhering to participatory principles. Better assessments would involve WN representatives looking away from the centres of YTN activity in villages to areas such as the forest zones where it would be discovered that farmers are continuing to farm traditionally. There is also a need to talk to ordinary recipient and non-recipient farmers in isolation from those they find intimidating. Considering what was said in Chapter 5 regarding the aims and motivations of WN, perhaps the donors have subconsciously overlooked the real nature of adoption and the existence of force. Instead, they have heaped praise upon YTN because they are eager to hear good things about their technology and they are keen to fortify their development paradigm which emphasises participation, agricultural improvement and appropriate technology.

Affording prestige to YTN has not only been misplaced, because in reality adoption has occurred using methods inconsistent with WN principles, it has also increased YTN's dependence on force by creating a situation in which the agency must sustain and increase its success. Prestige given to YTN for the high rate of adoption achieved, has increased expectations of the organisation and created a belief that adoption rates will continually rise. These expectations are held by donors, state agencies and other NGOs throughout NTT who have been informed of YTN's performance. Hence, to protect its pride amongst peers and its reputation as the premier grassroots NGO in NTT, YTN must continually increase adoption rates as expected. Given the highly competitive environment in NTT amongst NGOs and between

NGOs and state agencies discussed in Chapter 4, any decline in the rate of adoption, or recognition of significant reduction in the quality of adoption, would provide ammunition to agencies competing against WN/YTN for ideological, technical and financial superiority in the province.

Moreover, there is a material basis for the organisation to be concerned about erosion of its prestige and consequent decline in support from donors and other agencies both within and outside of NTT. Some high level staff have just begun to receive opportunities to act as consultants to government agencies.[6] These opportunities have been recognised as a means by which YTN can in the future become self-funding (Fisher *et al*, 1993: 3). The organisation's ability to procure consultancies would be threatened by a decline in its reputation. Similarly, reduced prestige and therefore funding, would endanger YTN's growing bureaucracy. Not only must YTN protect in the long term the numerous permanent positions that it has created, it must also continue to generate funds to sustain a gradual shift in the organisation's structure which is resulting in it becoming more consumptive and 'top-down'. Structural changes in the Sumba branch that have consumed the agency's resources and will place future demands on them for their maintenance include the purchase of land and an office in the regional capital of Waingapu and the staffing of this office with a permanent administrative officer. The formation of a seven member Management Board (*Dewan Pengurus*) and an Advisory Board (*Dewan Penasihat*) in 1992 is also illustrative of a move towards a more bureaucratic structure. Although these boards are yet to generate demands for additional funds their formation indicates a shift of resources away from service towards administration.

Maintaining an image of success is also crucial to YTN's individual staff members to retain the benefits tasted so far. As a result of prestige given to YTN for its role in getting farmers to adopt tree legumes, high level staff have received fully paid overseas trips, been promoted to positions in World Neighbours and secured their wages into the future. For low

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[6] In September 1993 YTN's supervisor acted as a consultant on soil and water conservation technologies to the regional government in Ujung Pandang, South Sulawesi.

level staff the continual increase of adopter numbers in the villages for which they are responsible is important because this satisfies high level staff and in turn donors. It therefore secures their positions and wages and increases their chances of moving up through the organisation to become extension officers. The expectation from the hierarchy that low level staff will continually attract new adopters is such that these staff members actually set themselves targets to secure new followers. Thus, as well as encouraging the use of targets by recipient farmers (which may be justified on the basis of enhancing long term thinking and planning), the organisation actually emphasises that low level staff have targets for attracting new followers. If almost all farmers have planted tree legumes new targets are made to plant other trees or to collect seed.[7] This contradicts participatory principles as it places pressure upon low level staff to enlist the support of government and local leaders.

YTN was initially dependent upon force exercised by government and the local elite because they were caught in a rigid mode of promoting one technology inconsistent with farmers' felt needs and desires. This rigidity was established by the donor organisation, facilitated by Sumbanese culture and maintained by the continued close relationship between YTN and WN. YTN is now even more dependent upon force used by local government and leaders to sustain and expand upon the adoption already achieved. This is because the use of these methods in the past has created prestige and an expectation that YTN will continue to succeed in encouraging farmer adoption. YTN is trapped into dependency upon force in order to protect its pride and the benefits of prestige which the organisation as a whole, and its members individually, have received.

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[7] A tendency for few villages to actually get to the stage where all farmers were planting legumes and new aims could be planned was observed in the study villages. Conditions began to deteriorate in villages where YTN had been operating for a period of time normally because the village government and traditional leaders had tired of the programme as their short term political aims for supporting it had been achieved and they too found maintenance more difficult than planting. As such they no longer provided YTN with the benefit of their force approach. In this circumstance it appeared that YTN tended to withdraw to new villages where interest from the village government was high because they had a political need for the project and where YTN could recommence from the planting stage which was easier to force farmers to begin. The exception to this was Ramuk where it had been possible to motivate farmers into adopting many aspects of the programme because of the intensity and unrelenting nature of pressure from the local government.

7.4.2 Reasons for willingness of the government and local elite to support YTN's programme

A general reason why members of the local elite and government are willing to assist YTN by pressuring farmers to promote the tree legume technology has already been mentioned. Often government officials and traditional leaders see it as their responsibility to promote any formal programmes operative in the villages in which they are working. However, these institutions also have specific political motivations for wanting to support YTN's technology. This means they promote it without considering its suitability to farmer conditions. A reason why local government (which is normally made up of members of the local elite) want to promote tree legumes has already been given above. Sometimes the village elite themselves fear being resettled but the rest of the population has not perceived the risk. They force the unaware majority to follow YTN so as to strengthen their claim to remaining where they are. Village governments may also take it upon themselves to request the technology on behalf of ordinary farmers and then force them to follow so as to increase the reputation of their villages and their own leadership, to receive income from village development prizes or merely because they think it is their responsibility to contribute to village development by acting in this manner.

None of the above reasons indicate that local government wishes to promote the technology because they want to increase agricultural productivity or assist recipient farmers. They are all related to creating an image. By adopting YTN's programme the village creates an image of development which either protects it from relocation or wins prestige for local leaders. In the same manner as WN was eager to heap prestige on YTN, district and regional governments have also been keen to interpret tree legume planting as success and a sign of development. This is because they can use the plantings to win praise for themselves as well. The regional government gave Ramuk (the most praised YTN village) the village development prize for the region and then entered the village into the provincial competition. Its placing in the top three villages of this provincial competition earned kudos for the regional government, district government and local leaders who won prize money, received grants and had the threat of relocation further diminished.

Regional government has realised the value of the technology in winning praise and so it has wanted to increase the spread and speed of innovation. Such is the desire of regional government to get farmers to plant these trees they have even mooted the idea of threatening to resettle farmers who they actually have no intention of moving so as to increase adoption rates. In addition to using the tree legume technology to increase prestige, regional government is using it to further its ambitions to get all farmers living by the main road on certifiable land rather than being in the valleys, living in a dispersed manner. Dispersed communities are more difficult to service and control. Regional government, citing the exaggerated advantages of the technology perpetuated by YTN and its assessors, says that since tree legume intercropping now exists there can be no reason why farmers do not live on certifiable lands and practice sedentary agriculture. Thus, they have used tree legumes to both increase their prestige and to quash protests to their provincial instructions insisting that people live in central locations. It is not important whether farmers with tree legumes can live in a sedentary manner on these lands or not. It is said that it is possible by both a highly successful NGO and farmers who have received the technology so others have no reason for not doing likewise. If they cannot cope it must indicate that they are ignorant or lazy because others have managed in the past.

7.4.3 Reason for the restriction of force to the promotion of YTN's preferred technology

None of the parties promoting tree legumes, from donors, to high and low level YTN staff, to government officers and the local elite do so because they are merely interested in the enhancement of farmers' agricultural productivity and livelihoods. All of these parties are interested in the adoption of this technology because it wins prestige for those responsible for the areas in which adoption occurs. This is because tree legumes and terracing have been recognised as an image of development by assessors of programmes at the highest level. Given the nature of promoters' motivations, farmers have not been forced to maintain tree legume gardens for two reasons. First, farmers are not prevented from abandoning their tree legume gardens by those who force them to plant the trees because it is recognised by these promoters

that they are unproductive and inefficient to work (highly labour intensive). Consequently, compelling farmers to spend an inordinate amount of time working them would lead to unnecessary hardship. Second, the image necessary to generate prestige can be sustained without their maintenance and high quality adoption. The mere fact that tree legumes are planted, in highly visible locations alongside the main roads, is enough to establish an image of development which satisfies assessors. If assessors do question abandonment they can be appeased and the image preserved by getting farmers to explain that they intend to turn the gardens over to tree crops; plan to reopen them shortly; or are letting the legumes grow so that they can collect seed.

Similarly, farmers are not prevented by either local government or traditional leaders from commuting to the forest zones to engage in traditional farming (only returning to their main road houses when guests come) because it is realised that this practice is essential to the food security of recipient farmers and the whole community, including the local elite. On the one hand therefore, village government and leaders force farmers to plant tree legumes but on the other they allow farmers to abandon these gardens and engage in the slash and burn of forest, so long as it is done out of sight. This is because in the minds of villagers (recipients and local leaders alike) these two activities have totally different purposes and one does not supplant the other. The purpose of tree legume plantings is to achieve political security by creating an image of development. They have no role in increasing agricultural productivity which is the purpose of shifting cultivation in the forest. This recognition of the importance of tree legumes in creating an image of development also results in promoters not forcing the adoption of other YTN technologies, such as horticultural trees. Tree legumes have been favoured by assessors (donors) and they are easily and quickly established, thereby generating an obvious and rapid image. Furthermore, farmers desire horticultural trees anyway and planting of them is often only restricted by technical factors and the agency's ability to distribute resources to farmers.

The argument that the forceful promotion of tree legumes and terracing has occurred to create an image of development which could fulfil the various political motivations of individual promoters, is further illustrated in the next two sections. First, the situation in Ramuk, the village with the highest adoption rates of YTN's technology, is closely examined. Then, support for the argument is provided by showing its consistency with behaviour influenced by greater Indonesian culture, in particular the concept of 'ABS' (that is, '*Asal Bapak Senang*' or 'So Long as the Boss is Happy') and with the theory of passive resistance by subordinate groups.

7.5 Ramuk, an example of force and illusion

7.5.1 Adoption of YTN technologies in Ramuk due to village head's force approach

The village of Ramuk in the district of Tabundung provides a vivid example of that stated above. It has been afforded the highest status as the village to have most successfully implemented YTN's programme. Farmer extensionists and YTN reports assert that every household in Ramuk follows YTN's programme and plants tree legumes. Quality of adoption of the tree legume technology has not been emphasised however, nor has the forceful nature of the approach actually responsible for much of this adoption. By focussing tree-planting around the village complex Ramuk's leaders have created an elaborate 'exhibition' in which guests and assessors (who decide whether the image is one of development) can be contained. They have thus disguised the fact that tree legume gardens are not productive and that residents of the village complex and owners of terraced gardens continue to be highly dependent upon the forest zone.

Ramuk was one of the first villages in the East Sumbanese uplands to be genuinely threatened with resettlement. The village was in the forest zone and a serious threat arose in 1975-76 after a Forestry Department reforestation project in the village failed. In response to this threat Ramuk's village head initiated his own tree-planting project to avoid resettlement. He

called this project "*mobilisasi*" (mobilisation). It involved farmers planting coffee and clove trees received under the subsidy desa programme in 1976-77. Farmers who resisted planting these trees were physically threatened and abused by the village head and other members of the elite. The success of this programme was such that in the late 1970s the village received a prize for development.

However, the threat of resettlement remained, and the village head was attracted to the WN/YTN programme when it was offered to his village in 1982 as a means of further strengthening his village's claim to remain *in situ*. The village head's attraction to the WN/YTN programme extended only to the physical technologies available and not to the NGO's methodological innovations. The village head preferred to increase adoption of YTN technologies by using the force approach he had developed during his mobilisation; it was effective and achieved rapid results. Thus, WN/YTN's arrival in Ramuk was quickly followed by the erosion of their participatory approach as the village head absorbed the agency's tree-planting technologies into his mobilisation. The role of YTN personnel in promotion of the technology using the organisation's methodological approach was soon usurped. They merely provided technical advice to farmers who had been ordered by members of the local elite to adopt the technology. YTN staff's change of role towards mere technical advisers is now complete and is confessed by current farmer extensionists.

Ramuk's mobilisation continues to this day, varying little from the programme developed in the mid-1970s. It has merely been enhanced to include technological innovations brought by YTN's programme. It presently demands that each year every male plant 100 horticultural and estate trees and every female plant 25 trees of these types, purchased with PKK funds. Every farmer must also construct facilities for nursing trees, make terraces and plant them with tree legumes. In addition, they must build houses by the main road and plant the required trees near these houses on certifiable land (a recommendation of the OPSUS which the village leaders are using their existing approach to achieve). The mobilisation approach did not involve ordinary farmer participation in the past and it involves none today. The quantities and

types of trees to be planted by farmers and any other plans are made by village leaders only. YTN personnel, church and local government officials gather at the RT (neighbourhood) level and make plans for the majority. Ordinary farmers have no say in determining activities that they conduct in their gardens and they have never been asked whether they like the trees promoted. A Dusun (community) leader in Ramuk explained that there was no point involving small farmers in planning because they are illiterate and find it difficult to conceptualise programmes.

To achieve farmer adoption of planned activities Ramuk's force approach relies on inspections of farmers' gardens. Once a year in early March the village head, educated people and successful farmer leaders go to every household in the village and inspect their gardens. They ensure that activities planned by village leaders have been achieved. At other times of the year such inspections are done by the *Kepala* RK (hamlet head) and the *Kepala* RT (neighourhood head). Those farmers judged not to have made sincere attempts to execute planned activities are dealt with severely. Residents gave various descriptions of what the village head does to those without good reason for failing to carry out orders (including the adoption of YTN technologies). These include farmers "*kena marah*" (incurring anger), being treated with "*kekerasan*" and "*paksaan*" (harshness and force), receiving "*kaboak*" (beatings) and being "*dipukul setengah mati*" (beaten senseless). The village head of Ramuk can act in such an autocratic manner because other village leaders agree with his motives to prevent the village from being relocated and have tasted the benefits of the physical development created by his approach. Ordinary farmers do not question his actions because they fear his status and reputation. The current village head has held that position since it was created in 1962 and he descends from the wealthiest and most noble family in Ramuk. In a relatively traditional village like Ramuk this makes the village head very powerful.

The local government's use of force is the major reason for Ramuk's success in getting farmers to adopt YTN's technology. YTN's participatory approach has rarely operated in Ramuk, especially not in isolation. This use of force explains variation in rates of adoption between

different villages. At quarterly meetings extensionists from other villages are ridiculed as to why they cannot get farmers to collect seed and perform other tasks while Ramuk can. They are asked to outline their approach when meeting farmers. They assert that they use a participatory approach, meeting farmers in small groups and using consensus to decide upon suitable plans. In relation to seed collection, a common plan has been to provide incentives to children to collect the seed. Ramuk extensionists are then asked their approach so that others may learn from it. They cite an identical participatory approach. This leads to much confusion, frustration amongst other extensionists and a general conclusion amongst those with a superficial view of the organsiation that Ramuk's extensionists must simply be better at and more experienced with participatory approaches. This pleases Ramuk's extensionists as it increases their prestige. The simple reason for this discrepancy however, is that no other villages have been able to get farmers to adopt a range of YTN technologies, including getting them to collect legume seed, because no other village has had the same intensity of force emanating from local leaders. In other villages the use of force is attempted but similar levels of adoption are not achieved because there is no one village leader so dominant in the village that everybody obeys his commands. There is normally a number of leaders who control loyalties in particular communities and who have not been united into one way of thinking because a serious threat to the entire village (such as the resettlement of everybody) has not materialized.

Although participation has been excluded in Ramuk, individual YTN staff and the organisation as a whole have received much prestige from the mere rate of adoption generated by the local leadership's use of force. YTN staff in Ramuk have tolerated and in effect utilised this force approach because it is advantageous for them and the organisation. For instance, YTN at no stage proposed to withdraw from Ramuk upon realising that local leaders had disregarded their methodological approach which YTN asserts is essential for long term adoption and human development. Instead, WN/YTN increased the expertise and resources available to Ramuk. Unlike villages entered by YTN in the 1990s, where extension officers are phased out after just a few years, Ramuk received intensive direction from extension officers for a period of nine years from 1982-1991. Over this time they had continual extension from the

organisation's most qualified staff who have since become the current programme coordinator and supervisor. They also received frequent, prolonged visits from WN's area representative. Attention given to Ramuk, even after realisation that the force approach was incompatible with and bound to render impotent its participatory approach, perhaps indicates that WN/YTN seized the opportunity provided in Ramuk to create a showcase of their preferred technologies. This showcase provided a niche in the region from which these technologies could spread to other areas. Therefore, upon realising the presence of force, WN/YTN made use of it to establish itself and its preferred technology in Sumba's uplands. That WN/YTN's major concern has been with the survival and establishment of its physical technologies rather than its methodological innovations is further supported by its willingness to operate in an area where that methodological approach was very difficult to pursue. YTN's perseverence in Ramuk was not to create an example for local government which would illustrate other approaches besides force, because as stated, YTN's participatory approach has not been in operation.[8] YTN staff normally give extension to farmers at meetings held at the house of the hamlet head or neighbourhood head. Attendance at these meetings is compulsory. Advice given by extensionists is supported by these local officials and farmers are expected to return to their fields to execute what has been described. At no stage do farmers have any choice as to activities which they feel are most suited to their situation. Furthermore, if WN/YTN had created an example for local government the use of force would have diminished. According to residents of the village however, it has intensified in recent times.

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[8] It has been stated by some staff members that because the organisation started with just a few followers in its first year in Ramuk and then increased slowly year by year until everybody is now following, that this indicates the use of a participatory approach. However, this is an illogical assumption. That YTN chooses to distribute its resources slowly over time has little to do with farmer participation. Obviously only those with access to resources can be forced into adoption. This merely indicates that YTN likes to exercise control over resource distribution. If anything this indicates a lack of participation: it would perhaps be more participatory if all farmers wishing to adopt in one year were permitted to do so. However, YTN avoids this level of participation fearing that failure will jeopardise the future reception of its preferred technology and programme.

7.5.2 Creation and maintenance of Ramuk's 'exhibition'

Farmers in Ramuk were called out of the forest zone and told to plant trees on land alongside the main road running through the village. This meant they focussed tree-planting around the two central RK of Winumauk and Ramuk. Tree-planting around these RK (which constitute an extended complex) is indeed impressive with coffee, clove, coconut, vanilla (a vine) and other trees abounding around people's homes and vast fields of tree legumes (predominantly red calliandra) spreading out across the surrounding hills. The village complex is also impressive for its vegetable gardens, the one or two head of cattle tethered in prominent locations, the pig pen in the centre of the complex, its general cleanliness and the size of its timber walled and iron roofed houses. The latter add to the feeling of wealth and productivity. The vista is completed by the construction of a new church and a number of concrete toilets all built using government grants given as rewards for physical development achieved. Next year the complex will be further improved by the piping of water from a spring. This project was financed by money received when the village won the regional development competition and earned a placing in the top three villages in the provincial competition. It will also be improved by orders to farmers to plant horticultural trees in their housegardens and intensify the planting of tree legumes so that, as the RK of Winumauk described, "from the main road all that can be seen is a sea of tree legumes".

Focussing tree-planting and other activities around the village complex stemmed from a deliberate policy of Ramuk's far sighted leaders to create an image of development that would help them avoid resettlement, and it worked. Ramuk became an enclave in the forest zone and was exempted from having to relocate in the 1980s, a few years after it was demonstrated that they had successfully followed YTN's programme. After the threat of resettlement diminished, leaders continued to improve the complex's appearance in order to win grants and prizes. This benefitted the village as a whole, and local leaders personally. Therefore, the physical development emanating from Ramuk's force approach, which has saved Ramuk from resettlement and resulted in many trees being planted, in a way justifies the use of that force;

the end result justifies the means. Perhaps human development cannot occur concurrently with physical development but results from that physical development, so that the latter must be achieved at all costs regardless of the means. This may be true and it is not the purpose here to dispute the ethics of using a force approach. The aim has merely been to describe what was responsible for the adoption observed and what were the positive and negative consequences of this, without making a moral judgement. Observing Ramuk, it appears that both the use of force and the existence of YTN's technology have had a major advantage in helping local communities (ordinary farmers and elite alike) avoid unwanted resettlement. Without the direct use of force on ordinary farmers of free and slave status, many may have declined to adopt the technology because individually they may not have perceived the risk of relocation.[9]

In Ramuk however, opportunities for human development have been quashed by the use of force, and the physical development that has occurred is non-productive and may in fact have worsened the material livelihoods of the poorest farmers. This is the disadvantage of Ramuk's force approach. The only purpose of physical development was to create an image of development. There was no real improvement in farmer conditions. Even asserted environmental benefits have not accrued (as will be discussed later, this is because the programme has not stopped environmental degradation but merely relocated it). As the motivation of local leaders to adopt and persevere with promotion of YTN's technology was forced (resettlement), they received tree legumes and other technologies, because they thought others would perceive their adoption as a sign of development and then let them remain in their village. They did not think that they would be able to increase agricultural productivity with these technologies. Similarly, ordinary farmers persevered with the trees even though they did

[9] It could be argued that ordinary farmers had to be forced into adoption because the 'risk' of resettlement was less significant for them than it was for members of the elite. Perhaps ordinary farmers were attracted to the prospect of resettlement so that they could escape the oppression of the elite and expose themselves to new opportunities. However, ordinary farmers' dependence on the resources of their surroundings and on the elite themselves, suggests that resettlement would be equally as unattractive for them. Ordinary farmers still rely on the forest yams, the social support of ***mandara*** and the protection and goodness of their nobles, for survival. Furthermore, even though they may not possess either the large areca nut tree gardens nor the traditional ***Marapu*** houses themselves, they can still, by virtue of family relationships, gain access to these resources to fulfil their economic and spiritual needs respectively. Moreover, if ordinary farmers want to relocate individually because they see new opportunities in resettlement sites, then they are in fact free to do so. Resettlement sites, like Kakaha, have been open to voluntary migrants from the study villages around the Wanggameti forest for some time.

not improve agricultural productivity because they too were aware of tree-planting's ability to ward off resettlement or because they felt physically threatened. In this sense the force approach was disadvantageous because it compelled people to adopt technologies that did not noticeably benefit them. It also prevented them from enunciating problems with these technologies.

The minimal productivity of technologies introduced at the village complex can be observed by critically examining their use and by looking beyond the complex to land use in the whole village. Tree legume hedgerows are one of the least productive and most disappointing agricultural innovations at the complex. The village succeeded in getting farmers to plant vast fields of predominantly red calliandra but not to intercrop them; most now lie abandoned. This abandonment is obvious in most locations, as hedgerows are tall, unkempt, often invaded by *C. odorata* and have no traces of crop residues. YTN farmer extensionists in Ramuk admit, when asked, that over 50 percent of farmers have abandoned these gardens. They say the trees have not assisted soil fertility so as to increase crop yields and they have been disappointing as shade trees, dying back or defoliating in the dry season. Of those farmers who do intercrop their legume gardens many reopen them with slash and burn rather than prune and till. Due to disapproval of this method however, the number of farmers choosing to slash and burn legumes is still small. In relation to tree crops, farmers have derived incomes from selling coffee and the traditional areca nut but have not benefited substantially from the sale of cloves. The price for this crop has dropped and farmers feel picking clove flowers is an excessively labour intensive activity. In short, benefits derived from tree crops at the complex have been inadequate to provide farmers with income or harvests that can reduce their dependence upon traditional activities, particularly cultivation in and exploitation of the forest.

While assessors of development in Ramuk have observed the village complex, they have neglected to account for continued farmer dependency on the forest and the inability of innovations at the complex to reduce this dependency. The intensity of innovations around the complex suggests that they are responsible for the welfare of the people. In reality however,

the forest has continued to supply their needs. For example, the large and solid houses of the complex were funded by the exploitation of *gaharu* (*Aquilaria sp.*) which farmers searched for in the mid-1980s, after YTN had come to the village and a decade after the village government's mobilisation. Similarly, the majority of food production (particularly of dryland rice) is still carried out in the forest zone using traditional cultivation techniques. Since most farmers have been prohibited from living 'permanently' in the forest zone they now commute from the complex to the forest. They stay in small garden houses while agricultural activity is intense and return to the complex when it slackens, guests arrive or gatherings are held.[10] Farmers from the village complex continue to cut gardens in forest areas above Ai Rara, at RT Patamawai and at RK Kamaru. This forest cultivation is done by ordinary farmers and by the village elite, that is the same elite which forces farmers to plant at the complex. The village secretary cultivates at Patamawai, the RK of Winumauk cultivates at Kalauki in the forest area and the village head himself up until the 1993/94 planting season cultivated at Kamaru. Farmers at Kamaru alleged that in 1991/92 the village head harvested 600 *belak* of rice (4800 kg) from the forest zone and cropping the same forest garden in 1992/93 he extracted 150 blk of rice (1200 kg). If there is crop failure as occurred in 1992/93 the people of Ramuk become even more dependent on the forest as they extract forest yams (*iwi*) from it to sustain them for the duration of the famine.

The presence of tethered cattle at the village complex and the absence of wandering cattle at that location also gives the impression that the introduction of tree legumes has allowed Ramuk to develop a 'cut and carry' system of livestock management. In reality however, those living at the complex retain wandering livestock in the same way that they retain shifting forest gardens. They have merely relocated them away from the village complex

[10] It would not have been difficult for farmers to either develop or adapt to this system of commuting between their permanent homes (often located on or towards the tops of ridges where roads run) and temporary dwellings near their gardens (often located on steep slopes towards the floors of valleys). This is because it mirrors the traditional seasonal movement of the Sumbanese. From the 17th century when Sumba's slave trade commenced, until pacification in the mountains in 1909, farmers moved to their dispersed garden houses in sloping well watered areas during the planting season and returned to a common mountain top settlement during the dry season and during periods of conflict for security or to engage in cultural activities (Kuipers 1990: 18-26, FAO 1992). Even after pacification when many families moved permanently to dispersed locations where there was fertile land so that they could tend and guard their fields, communal villages occupied by noble families remained, to which those living at the garden houses would return to participate in ceremonies (Fox 1977: 191, Adams 1980: 209)

where they are less noticeable. Many residents of the complex have released their cattle at other remote locations in the village such as RT Umandudu. The residents of this RT complain that wandering cattle owned by people living at the complex disrupt their agricultural activities. The village head moved his buffalo and other livestock to the forest zone at Kamaru in 1972 and they were grazed there out of sight until 1986. A marital relationship with the royal family of Nggongi has now allowed the village head of Ramuk to move his livestock out of the village altogether to Nggongi where they are still managed in a traditional manner. The perception of wandering livestock as a negative indicator of development by assessors and the intensification of the growth of *C. odorata* in the village (which is unpalatable to cattle) meant that it was in the village head's interest to move his livestock to Nggongi.

Not only have technologies introduced to Ramuk been unproductive and compelled farmers to carry on with traditional activities, they have actually had distinct disadvantages. One of these disadvantages is the deterioration in the situations of poorer farmers. It is evident that farmers must prepare two gardens: they are forced to prepare unproductive legume gardens around the complex to create an image of development and they must commute to forest areas to prepare traditional gardens for food. Due to the threat of violence farmers must prepare their legume gardens first and then once local leaders are satisfied they can concentrate on forest gardens to satisfy their own stomachs. The problem of poorer farmers is that they often lack labour to prepare both gardens. This means they fail to complete work in their traditional gardens and consequently suffer from food shortages. The problem is particularly felt by those poorer farmers who live very near the complex. Their proximity to areas frequented by visitors and to the homes of the elite means that they are under greater pressure to maintain their gardens well (perhaps even intercrop) and expand their plantings of legumes. Those living distant from the complex can abandon their legumes without attracting attention. This problem does not affect the wealthier because they can make up labour shortfalls by slaughtering a pig, goat or dog and then inviting others to work for them for a day, in return for two wholesome meals.

The other major disadvantage of technologies introduced to Ramuk is that they have distracted attention away from continuing forest degradation and in doing so perhaps even made it easier for farmers to contribute to this process. Visitor attention focusses on Ramuk's complex and this leads them to overlook activities in other areas such as the forest zone. This has allowed farmers to continue with forest exploitation uninterrupted. While obviously beneficial to farmers in allowing them to avoid resettlement, the real problem of forest degradation remains unsolved. Recognition of continuing forest degradation and the inability of introduced technologies to actually do anything about this may have allowed experimentation with alternative strategies.

People living in Ramuk's village complex, despite apparent developments at that location, have only survived by continuing dependence upon the forest zones for agricultural cultivation, product exploitation, grazing lands and as a source of food in times of famine. Village government sanctioned continued use of the forest, because they personally knew that the technologies introduced were unproductive to the extent that they themselves remained dependent on the zone. Hence, they could not possibly prohibit others from doing likewise. So long as farmers helped create an impressive village complex they were free to do as they wished out of view in the forest areas. It is because of the non-productivity of physical development at Ramuk's complex and continued dependence on forest zones not obvious from the main road that led one farmer from Kamaru to call the development at the complex a "*pameran*" or "exhibition".

The final feature of the apparent reception of YTN technology at Ramuk that needs to be outlined is the manner in which the real nature of adoption was concealed from assessors of physical development. Most responsibility for sustaining the exhibition rests upon the village leaders. They use two methods. First, they act as gatekeepers, controlling where assessors visit. Farmers at Kamaru were asked whether any visiting assessors or other guests had ever stopped at their RK in recent times. They replied that none had come because the village head normally told them to go to RK Winumauk and RK Ramuk and that would be enough ("*cukup*").

This is exactly what the village head had told the researchers upon arriving at the village. They also alleged that the village head guaranteed them that he would prevent outsiders from disturbing those cropping in the forest zone so long as each household paid him Rp 5,000 per year. It was very much this researcher's experience that members of the village elite and YTN staff could be easily found for trips around the complex but were disinclined to visit more distant locations. This was possibly to discourage visits to those sites, relying on the belief that outsiders would be unlikely to travel to such areas alone.

A second method village leaders used to sustain their exhibition involved extending coercion upon ordinary farmers to prevent them from making negative comments about the village and introduced technologies when they did meet outsiders. By having gatekeepers contain guests to the complex and always accompany them in this area supports this method because ordinary farmers are loath to make negative comments about introduced technologies in the presence of those who pressure them into adoption. An example of ordinary farmers' reluctance to tell the truth in preference to what they should say when in the presence of the village elite was given by a neighbourhood head and hamlet head from Kamaru. They said that when the provincial team recently came to assess the village for a development prize, a large compulsory meeting was held at the village complex. At this meeting the neighbourhood head was asked by the team whether he and the people of his neighbourhood received goods from the village subsidy programme. He replied that they had. In reality however, nobody from Kamaru has ever received goods from this source. Similarly the hamlet head was asked whether the meeting to request goods from the subsidy programme was a general meeting or just one of high level government. The hamlet head replied that it was a general meeting, however it was not. These men said that they could say little else, as the village head was sitting not far from them. The hamlet head said that he felt like a 'dog waiting for a bone' (implying open to attack). He said that if the team had asked him his thoughts in private he would have given a more truthful response.

However, such is the nature of pressure acting on farmers, even in private situations they are reluctant to give their true thoughts as regards introduced technologies. A small farmer living at RK Ramuk was asked whether he 'liked' tree legumes. Although he had been talkative up to that point, he fell silent. When his wife asked why he did not respond, he said in Sumbanese to her that he was scared and did not want to answer this question. Finally, as well as being told what to say, farmers are told what to do, in order to create a certain impression for guests. For example, three days before the provincial team responsible for evaluating the villages in the final of the village development competition were due to come to Ramuk, the village head told all farmers not to dry forest yams in front of their houses until after the team had left. The presence of these yams would indicate that the village was undergoing a hungry season that the village head did not want to publicise.

YTN staff who are working and have worked in Ramuk must have known of the use of force to promote their own technologies, problems with their technologies and continued dependency upon forest zones. Due to this awareness, they too have had a role in concealing information from assessors and preserving the Ramuk 'exhibition' which has been a major factor in developing the organisation's prestige and which, with the stagnation of the programme in villages such as Wanggameti and Katikuwai, is essential to sustaining YTN's reputation. The tendency for YTN to conceal the use of force and sustain Ramuk's exhibition can be seen by observing the pressure placed upon individual staff members to maintain silence. During a private interview, a young farmer from Ramuk said that if people in his village did not adopt YTN's technology the village head became very angry with them and physically threatened them. This farmer was asked whether he thought that this was coercion and he said that it was. As this farmer had attended YTN's quarterly meeting at Pinduwatu the researcher asked him, "At the Pinduwatu meeting I said that many farmers followed YTN because they were forced, but nobody agreed with me. Everyone at the meeting (YTN staff) said that nobody is forced, they all follow of their own accord, they freely follow because they see the example of other people's gardens. Don't you think it is funny when you hear YTN staff say that at meetings, knowing what you know?" He said, "Yes, it is definitely funny (*memang lucu*)". He

was then asked, "Why did you not '*yama*' (agree with) me when I said this, so that I would be encouraged to continue talking and why did you not disagree with the YTN people when they said this?" He replied that this was because, "We have to live with these people in this village and if I agreed with what was real YTN people would be angry with me". He said that YTN staff would not physically threaten him for saying this but they would look down on him and he would be ostracised. Therefore, YTN has denied the existence of force in public because they realise it is a negative image of development in the minds of their assessors. In reality however, they have been and continue to be highly dependent upon force exercised by government and traditional leaders to encourage farmer adoption. Such is this dependency, YTN has exerted some pressure itself against those closest to the organisation to retain the veil of secrecy over the existence of farmers being coerced by government and leaders into adoption. They are using peer group pressure on low level facilitators to hide the fact that force is used to motivate ordinary farmer adopters.[11]

The village elite of Ramuk with the cooperation of YTN have made deliberate attempts to disguise the real nature of adoption in their village and sustain their exhibition. The success of their attempts is demonstrated by witnessing comments made by foreign guests about the conditions of Ramuk recorded in Ramuk's guest book. The entirely complimentary comments from the 1991 World Neighbours Assessment team which spent four days in the uplands and one in Ramuk included, "...impressive farmers, impressive farms", "Impressive application of many important appropriate technologies", and "Excellent examples of farm development...".

[11] Further first hand evidence of the pressure that YTN places on low level staff members to maintain silence and conform to the organisation's preferred image was witnessed at a meeting organised by YTN to discuss this research's preliminary results in October 1994. This meeting was attended by about twenty people including senior and low level staff and farmer motivators. Senior staff objected to many of the research's results and invited low level staff and motivators to support the researcher's statements which often referred to these groups in general as informants. Hence, they were asked individually one by one and directly before the forum whether they had observed any use of coercion in their villages. Understandably all of those questioned said that they had never observed force. With regard to the issue of women in the organisation also, none of the staff members were prepared to stand by what they had said privately at the meeting. This strongly indicates the peer group pressure at these meetings.
Indeed, the pressure placed on those who wish to talk about the relationship between force and the organisation was also experienced personally by the researcher. WN and donor representatives initially responded to preliminary results given to them by the researcher with minimal discussion. Instead, they preferred to intimidate the researcher by saying that the results if published would neither be believed nor help the researcher's future prospects and by attacking the researcher's credibility by inventing allegations that he had bribed farmers to get the results desired.

Similarly laudatory but predominantly grateful statements came from representatives of Winrock International, the Ford Foundation, Yale University and Save the Children. In the guest book the only foreign visitor to suggest that all was not as it seemed in Ramuk was from World Education who said that farmer leaders and village government should turn their attention to RK Kamaru and RK Bidihungar (RT Patamawai and RT Umandudu) because agriculture had not changed there and they were poorly serviced with seed and extension. Similarly, of the many local guests the only statements to refer to the real situation in Ramuk came from YTN's peer NGO, Yayasan Geo Meno. Representatives of Geo Meno noticed that many tree legumes had been abandoned. This led them to recommend that maintenance was more difficult than mere planting and needed the attention of extensionists.

Nevertheless, guests contributed to their own deception by the shortness of their visits. The above mentioned guest book indicates that of a total of 160 guests to come to Ramuk from June 1991 to October 1993, the average length of stay by foreigners was 1.8 days; for visitors from Indonesia but outside of Sumba it was 2 days; and for local visitors from other areas of Sumba it was 3.6 days. The rapidity of these visits would have made it easier for Ramuk's gatekeepers to keep visitors contained in the village complex. Moreover, many guests attended the village to take part in formal functions located only in the village complex for the period of their stay. Many people staying for longer periods of time came to the village on this basis (for example, in 1993 there was an agroforestry conference held in the village by YTN which took place over three days). That many of those coming to Ramuk did so to take part in these functions means that the average length of stay of those coming for other purposes would be even shorter. It also would have made the task of limiting guests to the complex more achievable.

Another means by which guests and assessors travelling to Ramuk have contributed to their own deception is by the lack of rigour of their assessments and their eagerness to want to reinforce their preconceptions of the programme. In the past, assessments have not been objective. Most parties involved in visiting and assessing Ramuk to date have had their own

motives for wanting to see the programme succeed. An example of the willingness of assessors to accept and then relay good reports about the programme, even though they may not have an objective basis for believing these reports, is provided by comparing WN's Southeast Asia Three Year Operational Plan from 1993 to 1996, compiled by Fisher, Fisher and Domingo (1993), with WN's Southeast Asia Strategic Plan for 1995, compiled by Wodicka, Jackson and Domingo (1994). These two documents, although attributed to different author teams (with just the one common minor author) are disconcertingly similar. The more recent document is merely an exact 'word-for-word' copy of the earlier document's preliminary sections with a little reordering of the paragraphs. Hence, Wodicka *et al* have not written the latter document from their own observations and beliefs but are merely relying on the testimonies of Fisher *et al* contained in the earlier document for their impressions of the programme. This reliance extends to the exact words used by the earlier authors. The willingness of Wodicka *et al* to believe the comments of the earlier authors includes them copying pro-programme statements and taking those comments as their own. This indicates a lack of rigour in the assessments and statements made about YTN, and a tendency to merely accept what has been said in the past without individual critical analysis, because of a willingness to want to believe good news. It also illustrates how mystique about organisations like YTN can be created. As more authors are expressing the point of view that YTN is highly regarded and successful, this concept's validity is strengthened and it is considered to be more true. This is even though two authors are merely relying on the statements of the earlier authors and have not made, or at least expressed, independent assessments. It becomes increasingly difficult for others to challenge this largely unproven concept, as a daunting barrier of opinion is created and defended by its growing body of believers.

Inability of guests to see what is happening in Ramuk, as a result of deliberate attempts at concealment by local leaders and YTN staff and perhaps the eagerness of assessors with vested interests to see the programme succeed, has been responsible for the increasing use of and dependence on force, the decline of participation and consequently also of human development. The more assessors agree that, as a result of the programme, development is

occurring and increase the prestige and funding of those responsible for its implementation, the more it becomes important to maintain the programme's success so that these benefits continue. As all success has only been achieved through the use of force, this means that approach must be intensified so as to keep adoption on the increase and to silence those who would disclose its use. Furthermore, prestige given to Ramuk encourages residents of other villages eager to savour similar benefits to enquire as to the methods used by Ramuk's implementers to achieve success. Residents from other villages rarely attract the attention of gatekeepers so they quickly discover the real reason for farmer adoption and consequently, Ramuk becomes an example of force to which they aspire.

7.6 Support for the described scenario from greater Indonesian culture and passive resistance theory

This section reinforces the plausibility of the described scenario asserting that tree legumes and terracing were adopted and promoted via the use of force to create an image of development that could fulfil the various political motivations of individual adopters and promoters. More specifically, it supports the accuracy of the particular observations and explanations given above relating to the behaviour of ordinary farmers, traditional leaders, government officials and YTN staff. To reiterate these observations;

i) The incentive to adopt the technology for many ordinary farmers in the study villages is merely to conform to demands made of them so that they avoid perceived threats of either resettlement or physical and psychological retribution.

ii) Local leaders themselves adopt, and force others to adopt the technology to a level of low quality, because they too perceive resettlement as a danger, or because they feel it is their duty to promote all formal programmes entering their village in order to win accolades or satisfy the expectations of superiors.

iii) Both government officials and YTN staff encourage farmers to adopt the technology to at least a level indicating conformity to the programme. They misinform assessors to ensure that

they are pleased with these efforts, because they prioritise assessors' satisfaction over the technology's value to recipients. Assessors control support to the programme and therefore, influence their personal welfare also.

The aim here is to further support the notion that this behaviour is occurring, by showing that it is not extraordinary. It fits within general Indonesian culture and is consistent with broader theories relating to peasant culture and the interaction of subordinate groups with superiors.

7.6.1 Support from a general culture of conformity and specific conformist attitude

The notion that those receiving and promoting YTN's technology are concerned with the thoughts of their immediate superiors and ultimately of assessors and the idea that these groups would renounce true desires and observations to create an impression of conformity pleasing to superiors, is supported by this alleged attitude's consistency with a general culture of conformity pervading Indonesia. This conformity originates from a deference to authority that is firmly established in the psyche of Indonesians in general and is particularly strong amongst groups like the Sumbanese, who continue to live in traditional, semi-feudal situations. As well as originating from traditional culture, Schwarz (1994) indicates that respect for and conformity to the desires of authority over individual interests has been strengthened by the policies of Indonesia's New Order central government. Schwarz (1994: 41, 47) says that the New Order administration, as a part of its obsession with control, has tried to make all Indonesians share a single view approved of by the state, squashed initiative and made individuals afraid to speak their minds. Cited by Schwarz (1994: 235), the Indonesian legal activist Adnan Buyung Nasution says that the government has an attitude that it is "...insulting when people oppose or even question government actions ... Opposition is interpreted as distrust of the good faith of the ruler...". Nasution said to Schwarz (1994: 246) that the central government's expression of this belief and its reinforcement by state agencies means that ordinary Indonesians are afraid of all authority figures (including low level officials, such as police) because they know that,

"...anyone who disagrees with the government is automatically considered an opponent of the state".

Throughout Indonesia there are pressures from traditional and modern institutions that make ordinary people scared of all authority figures and reluctant to do anything but follow, in an unquestioning manner, plans and programmes introduced by these figures. Although, as indicated in the work of Schwarz, the purpose of this pressure is to prevent individuals from opposing central government programmes, this does not mean that people only fear the officers and plans of this level of government only. In Indonesia's highly centralised system ordinary individuals fear and conform to the demands of all agents in positions of authority (and even those who are not in authority but merely have a degree of formality) regardless of the level at which these officers operate. It is understood that the authority and formality that they possess must have been granted by the central government. It is presumed that even those with the weakest authority must nevertheless be acting on delegated power given to them by the centre, meaning that they cannot be disputed.

As conformist behaviour designed to appease those with authority is a cultural norm in Indonesia, plausibility of the notion that individuals in East Sumba are engaging in this type of behaviour when adopting and promoting YTN's technology is increased. Further support comes from examining a specific attitude of conformity and appeasement that originates from the general culture of conformity. The behaviour of adopters and promoters of tree legumes and terracing is consistent with a conformist attitude informally referred to throughout Indonesia, Nusa Tenggara Timur and East Sumba as ABS or *Asal Bapak Senang* ('So Long as the Boss is Happy'). This attitude is widely known and adhered to by officials of both government and non-government agencies. Central to an attitude of ABS are the following characteristics. First, subordinates agree with everything that their superior says and plans, without question. Indeed, subordinates may even emphasise how good and true the superior's ideas are. Second, subordinates execute exactly what the superior says so as to satisfy the superior. Finally, and most importantly, regardless of the outcome of the effort to execute the superior's orders,

subordinates report to the superior about these efforts in a manner which keeps that superior happy. Due to the primacy of satisfying the superior, it may be necessary to engage in misinformation by only reporting good news and by drawing attention away from or concealing information that would anger or displease the superior. To further illustrate ABS and to prove its existence amongst the agencies of East Sumba, a recent example of its occurrence in the region, recorded in NTT's mass media, will be described.

On 15 October 1993 NTT's only daily newspaper, *Pos Kupang* (No. 256: 1, 12), reported that in two villages, Prai Bakul and Kombapari, in the East Sumbanese district of Lewa (approximately 85 km west of Waingapu), 2,000 people were suffering from drought induced famine. This had forced these people to the forest where they resided for up to a week at a time collecting and processing forest yams. They had been dependent upon this food source for three months since August. This news was collected by the newspaper's own journalist who visited both villages. The journalist spoke to both of the relevant village heads who said they had reported severe food shortages to Lewa's district head months ago but nothing happened. As they received no assistance they turned to the forest. When approached by the journalist however, Lewa's district head denied there was a famine in the two villages. He asserted that he had received no news of food shortages in any villages in the district. He also drew attention to the fact that earlier in the year the district had harvested a surplus 100 tonnes of rice which was sent to Waingapu. This was evidence, he said, that there were no problems with food availability. The inconsistency of the journalist's observations and the statements of village leaders with the assertion of the district head led to a major conflict between government officials at all levels, as agencies sought to allocate and avoid blame for the purported situation. Although in the end the conflict was defused by concilitatory comments from the village people who had initially stated that they were in famine, at its height the conflict placed great pressure on district and regional officals. This pressure arose from accusations that they had contributed to the situation's severity by adhering to an attitude equivalent to ABS. Closely followed in *Pos Kupang*, it is from this source entirely that the following account of the conflict was

extracted.[12] This account indicates that ABS occurs in East Sumba, illustrates its form, provides reasons why it occurs, and describes the damage it can cause.

Responding to news of the famine the deputy Governor of NTT's provincial government said that he was shocked because he heard of the famine via the newspaper rather than receiving a formal report from East Sumba's regional head. The regional head however, said that he too had received news of the famine via the media only. He had instructed the district head to investigate whether the famine was real. Dissatisfied by the regional head's reliance on a report from the district head, the province's Governor recommended that the Secretary of the regional government be sent personally to the two villages to determine the condition of farmers. Pressure also came from a Sumbanese representative to the provincial People's Assembly (DPRD, *Dewan Perwakilan Rakyat Daerah*) for the regional government to conduct its own investigation into the reports of famine. This representative also began apportioning blame by suggesting that the district head should be punished for failing to report the famine.

By 21 October the regional government had conducted an enquiry into the famine but decided that the situation was not serious. The head of BAPPEDA at the regional level said that farmers were looking for forest yams, but he said this did not imply there was a famine. He asserted Sumbanese did not extract this product because of hunger but because they liked its taste and used it to add variety to their diet. Reference was again made to the 100 tonnes of rice that the district as a whole had sold to Waingapu in 1993 as evidence that there were no food shortages.[13] As a result of this enquiry the regional head concluded there was no famine. However, the famine's denial and suggestions Sumbanese looked for forest yams because they

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12 The account is portrayed over two weeks in *Pos Kupang* from 15 October to 1 November 1993 in edition numbers 256 to 270.

13 At no stage was it considered that the anomaly of rice being exported from the district while many farmers suffered from hunger could be explained by the increasing modernisation of wet rice agriculture in Lewa. Large areas of the best land have been transferred to either Chinese merchants or regional government officials both of which are groups based in Waingapu. It is likely that these landholders could continue to get harvests and sell rice even while ordinary farmers with small areas of poor land received minimal returns. Traditionally those with the best land would distribute their harvests to others via the system of *mandara* so that nobody received an excess but so that others were less prone to famine. However, these urban landowners do not feel obliged to follow such traditions.

liked them, were not well received. These statements were angrily refuted in many quarters. The head of the provincial government's coordinating bureau (*Kepala Biro Umum*) said that the head of BAPPEDA's statements were nonsense and typical of somebody who rarely visited the villages. He asserted that yams were only extracted in times of crisis. Those responsible for the villages in question, and the regional government team making the initial report, struck more trouble when an assessment team from the regional People's Assembly visited the districts of Lewa and Tabundung including Prai Bakul and Kombapari. They contradicted the regional government's team by finding that there was a famine in the two villages mentioned and serious food shortages in another eight villages within these two districts. They also verified that there were reports that food was a major problem in another three districts, Pandawai, Paberiwai and Hahar. Nevertheless, those immediately responsible for the area in which the famine was occurring, the district head, regional head and the regional government's team (including the head of BAPPEDA), maintained that there were no serious food shortages. In the face of mounting pressure they based their defence on semantics and definition. On 22 October, Lewa's district head said that there was no famine but he would receive food aid if it was given to relieve a 'failure of the harvest' rather than a 'famine'.

Unfortunately for those responsible for the famine areas, semantic defences were scorned by both the provincial government and the provincial People's Assembly. Members of these institutions became increasingly impatient with Lewa's district head and East Sumba's regional government. Their continued reluctance to acknowledge the famine despite growing evidence to the contrary and their unwillingness to accept responsibility, led to accusations that these officials were negligent and had adopted an attitude of ABS. The assistant Governor of southern NTT for example, said that the regional government was merely trying to defend itself by saying there was no famine. Criticising the regional administration heavily it was said that this behaviour was common. He claimed that over the last ten years famines had often occurred in East Sumba but were never admitted by the regional government because its officials were afraid of reporting bad situations in case they displeased higher government levels. He suggested that this made local people suffer in two ways. First, they were forced to

publicly deny their hunger to appear consistent with the regional government. Second, by refusing to admit the situation the regional government denied assistance to them from the provincial level. These sentiments were shared by leaders of both the Indonesian Democratic Party and the United Development Party in the provincial People's Assembly. The leader of the Democratic Party said that the famine could have been quickly overcome if the district and regional governments had reported the situation openly and honestly. He suggested however, that they were worried about their positions and politics and as such acted in a manner that would preserve their personal prestige. This meant they had sacrificed the welfare of ordinary people for selfish purposes. Similarly, the United Development Party's leader said that the regional government placed personal priorities above those of the people. As a result they could not be trusted to report honestly on the situation in their area of responsibility.

Due to conflicting reports of the famine and widely held suspicions that the district and regional governments were denying the problem to preserve their personal prestige, the provincial government sent its own team to East Sumba to determine whether assistance was needed. There were also calls by provincial government officials and the heads of the United Development Party and Armed Forces factions of the provincial People's Assembly that those responsible for the area in the district and regional government should be officially punished if this team found that the purported famine was real. Subsequently, on 28 October the assistant Governor formally pronounced that the provincial team had found that there was famine in the two villages initially referred to and that something needed to be done immediately. As a result, on 1 November, seventeen days after the story was first broken, the Governor of the province himself visited the two villages to distribute seed and rice to the victims.

During the Governor's visit however, farmers at the village level downplayed the famine's severity and supported comments made by the district and regional heads. Consequently, these officials were saved from public humiliation and avoided official punishment. No longer were village leaders emphasising that they had been in famine and that the district government, although informed of their condition declined to assist, as told to *Pos*

Kupang's journalist. Instead, village leaders told an identical story to that of the district head (who attended the Governor's visit to the villages). They said that reports they were in famine were false. They had merely experienced a food shortage due to a failed harvest. They claimed this did not constitute a famine. They also stressed that nobody had died from hunger (a point emphasised by the district head later on in the conflict to diminish the situation's severity).

An attitude of ABS therefore, is strongly ingrained amongst ordinary farmers and the officials of district and regional administrations in East Sumba. According to the province's assistant Governor this attitude has been popular amongst the regional administration for a considerable time. The description of the attitude in the above example is typical and consistent with the general principles mentioned. Officials at all levels conceal bad news from their superiors, up through the chain of administration, so as to avoid displeasing the latter. As is evident in the example, ordinary farmers also adopt an attitude of ABS. As is characteristic, they supported the statements of officials responsible for their area, even though that meant denying their condition and the problems they were encountering. Reasons why officials and ordinary people adopt these attitudes are also clear from the example. Officials prioritise their own prestige over the welfare of those they are supposed to serve. Ordinary farmers fear the consequences of not supporting those officials with whom they have frequent contact and in whose hands their future welfare and representation rests. Finally, the damage caused by ABS is also obvious. Ordinary people suffer greatly because it is their desires and problems that are concealed.

The rationale used to explain the behaviour of adopters and promoters of YTN's technology is highly plausible because it is consistent with ABS, an attitude which the above example shows is prevalent amongst ordinary people and government officials in East Sumba. This consistency extends to specific similarities in the attitudes demonstrated by farmers and NGO staff engaged in YTN's programme with those held by the actors in the above illustration. In both instances ordinary farmers deny their desires and problems because they wish to conform to behaviour that will satisfy those immediately above them in the hierarchy. Similarly,

in both situations low level staff members ignore bad reports and engage in misinformation to retain the image of conformity that they have created, in order to please their superiors. In both circumstances the satisfaction and 'happiness' of superiors and assessors is placed above the welfare of ordinary people who are supposed to be served. Although YTN is an NGO rather than a government agency, its staff, like government officials, are motivated by a desire to increase personal prestige via performances intended to please superiors. This is a consequence of the organisation's structure, in particular its method of incentives.

As a final note on the above illustration of ABS passing attention should be given to the provincial government's role in this conflict. As described, most of the pressure was on East Sumba's district and regional governments. The provincial government suffered no scrutiny and was indeed the source of much pressure on the lower levels. For an attitude of ABS to become entrenched in the administration's lower levels however, it must have been practised successfully and without penalty for some time. This suggests that the provincial government was either totally unaware (suggesting negligent supervision), or else tolerant, of the attitude's existence. As the assistant Governor said that ABS had been a feature of East Sumba's regional government for ten years, this suggests that the attitude was known about but not dealt with. This long term inaction raises questions as to whether the provincial government has interests in adherence to ABS by subordinates and what benefits it could possibly extract from this use. It could be contended that the provincial government itself has similar interests to that of the regional administration. Not being informed of problems in the villages saves the provincial government the embarassment of having to admit them. This prevents damage on the local political stage amongst constituents and on the national scene amongst yet higher levels of government. Thus, the practice of ABS by those at the village level allows the provincial government to hide these situations from their 'bosses', that is the provincial populace and the central government, both of whom will assess their administration's performance during and after its term.

In this case, the provincial government had at least an intention to punish those officials who adopted an attitude of ABS. This is an exceptional case however, in that it was publicised and thus became known about by ordinary constituents throughout the province and by officials at the national level, the provincial government's 'bosses'. It is important to remember that the story was broken by *Pos Kupang's* journalist, not the provincial government, and criticism from the provincial government only came after this news was released. The provincial government too, may have preferred it if the story was not printed. However, as it was and because those to whom it was responsible had discovered the situation, it had to adopt an attitude of severity that would satisfy these 'bosses' and shift attention away from their own role. A common first defence in these circumstances would be to discredit the third party reporting the story, the journalist. The regional government could be seen to be adopting this strategy when its team strongly disputed the journalist's findings.[14] However, in another exceptional and uncharacteristic development, government officials publicly broke ranks by quickly supporting the journalist. Perhaps for political reasons Sumbanese officials of the provincial government and members of the People's Assembly agreed with the journalist rather than the regional government.[15] This support left the provincial government with no choice but to condemn the district and regional administrations or else risk being accused of ABS themselves. Consequently, they focussed criticism on the district and regional governments, effectively because they were closest to the situation, using them as scapegoats. Fortunately for the provincial administration, nobody questioned whether higher levels of government should retain some responsibility for the failures of those exercising delegated power.

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[14] Such was the dislike of Lewa's district head for the attention of *Pos Kupang* and its journalists, that he requested the Governor, during his visit to the two villages, to stop the newspaper from discussing the famine and resulting conflict any further because this publicity had led to a continuation of the district's drought.

[15] Scepticism of political motivations behind support for the journalist and refutation of the regional government, stems from the fact that this conflict occurred shortly before the selection of a new regional head of East Sumba was due to occur and at the time that an assessment of the outgoing administration was occurring. This conflict did not reflect well on the outgoing regional government and so would have damaged the chances of candidates for regional head who were closely associated with that administration. Interestingly, the Head of the provincial government's coordinating bureau (*Biro Umum*), who was the first reported supporter of the journalist and critic of the regional government, was one of the candidates for the position of regional head. He was in fact eventually successful.

This contention as to the role of those at the top of the hierarchy in contributing to and facilitating ABS is also consistent with YTN's situation. Adherence to ABS by recipient farmers and YTN staff members is facilitated by negligent inspections and tolerance of this approach by assessors from WN. They are satisfied to rely almost entirely on the word of those below them, without the implementation of safeguards to ensure genuine accountability. Although it is impossible to determine whether assessors consciously cultivate ABS, its existence works to their benefit. It allows them to proclaim that their projects are successful to those individuals, government and non-government agencies in western developed countries that provide them with funds, and which can hence be described as their 'bosses'.

7.6.2 Support from passive resistance theory

Plausibility of the rationale explaining behaviour of promoters and adopters of YTN's technology, is also supported by showing its consistency with the general theory of passive resistance by subordinate groups.[16] The description of ABS began to explain why those involved with YTN's programme would conform. The theory of passive resistance reinforces these notions and then goes further. It specifically supports the likelihood of that part of the rationale which says conformity is only half of the phenomenon because, behind the scenes away from public view, farmers are not conforming but are instead engaging in activities formally discouraged. These include the abandonment of legume gardens and cutting of forest lands to plant food crops. Similar to that argued in the rationale, passive resistance theory indicates that conformity on the surface and disobedience away from public view is one behavioural phenomenon followed by subordinate groups so that they may enhance their own interests and upset the plans of superiors that may disadvantage them.

In passive resistance terms, the agenda of non-village powerbrokers (government agencies above village level) which people in Paberiwai wish to subvert is the threat of

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16 In general terms the concept of passive resistance has been best articulated by Scott (1985, 1990).

resettlement based on their proximity to and use of forest lands. That farmers should engage in passive resistance to oppose emerging state control over forest lands has been well documented by Guha (1989) and Peluso (1992).[17] Most villagers in Paberiwai are aware of at least one of the threats facing them if they continue with practices perceived to degrade the forest (such as shifting cultivation) and do not adopt YTN's technology on certifiable land. These include threats of resettlement and physical and mental intimidation. To avoid these threats farmers conform to what is expected of them by appearing to cease shifting agriculture and by planting tree legumes and making terraces alongside the main road. Consistent with the rationale of Scott (1985: 320), this conformity occurs because farmers realise that it is impractical and/or dangerous to act in any other way.

In a genuine passive resistance manner however, Paberiwai's villagers have a 'hidden transcript' which renders this conformity ineffectual, thereby subverting the external powerbrokers' plans and strengthening ordinary farmers' interests. This 'hidden transcript' includes the abandonment of tree legume gardens by the main road. This is concealed by comments of conformity asserting that farmers like the technology but are temporarily not using it for reasons that appease YTN's assessors and government agencies. Second, it involves farmers' continued use of forest lands for gardens and product extraction. Eased by their public conformity (which reduces suspicion and creates a distraction), continued activity in the forest lands subverts an essential aim of farmers' superiors to protect this resource. The last component of the 'hidden transcript' of Sumbanese farmers is that private discourse which discusses the disadvantages of tree legumes and terraces and maintains the advantages of utilising forest resources and *Chromolaena* lands. This discourse undermines messages coming from superiors as to the value of YTN's technology and the importance of preserving and not using forest.[18] This 'hidden transcript' prospers and meets farmers' interests because it is

[17] Although it should be noted that the resistance observed by Guha in particular often extended beyond the realms of passiveness to include blatant, open confrontation.

[18] That assessors of YTN should have obtained an inexact view of the factors motivating farmers and their true beliefs about the technology is also supported by passive resistance theory. Despite strong denials from these assessors as to the truth of the given rationale it is evident that, consistent with passive resistance theory, farmers would not express their private discourse to those who they believed could bring about those threats which they are trying to avoid. To do so would be unconformist and would undermine their conforming action of planting the trees in the first place. The private disregard for the technology which they

anonymous and occurs outside of those areas visited by powerbrokers external to the village. These groups are consequently ignorant of the transcript. Those government officials, traditional leaders and YTN staff at the village level, although aware of the 'hidden transcript' of ordinary farmers (their subordinates), can tolerate this behaviour. Scott (1990: 204) says that, "Many forms of authority can tolerate a remarkably high level of practical nonconformity so long as it does not actually tear the public fabric of hegemony." Therefore, as local leaders in Paberiwai realise the importance of the activity to ordinary farmers' livelihoods and because they maintain the desired image without complete conformity they permit the 'hidden transcript' to be executed. It does not affect the power and agenda of these local leaders and so is permitted.

The rationale given for the behaviour of farmers in Paberiwai fits well with passive resistance theory. Thus, it derives much support from this theory's existence which acts as a precedent for the interpretation provided. However, not only does passive resistance theory support the given rationale, but events in Sumba further strengthen the concept of passive resistance. The above account provides another instance of small farmers using public conformity and private disruption and stubbornness to serve their own interests. More specifically, the situation in Sumba supports Scott's concept (1985: 320) that conformity to a particular activity can occur without belief in the advantages of that activity and conversely, that conformity by itself cannot be interpreted as belief in the activity. Conformity by farmers is merely a consequence of them identifying what it would be threatening to ignore rather than resulting from them believing what they are told. In Sumba farmers were conforming and planting tree legumes and terracing even though there was significant evidence to suggest that they do not believe in this technology's advantages. This evidence includes their private discourse as to its problems, the high rate of abandonment and the continued emphasis on

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mention to the researcher and others who make efforts to show their objectivity, they would not dare mention to those known to be disapproving of such comments. Scott (1985: 4) says that to identify the hidden transcript one must look off-stage, one has to look off-stage to see what is occurring on-stage is just an image. However, he also says that this off-stage realm is to be found "...outside of the earshot of powerholders..." (Scott 1990: 25). For assessors this means that they are isolating themselves from the hidden transcript by having an obvious bias towards the technology and by always conducting assessments with members of the local elite and YTN staff members who are seen to be powerholders.

traditional farming techniques, many of which were in the forest zone. Therefore, previous analyses describing passive resistance in general and in relation to the state's attempts to control forest resources are precedents that give credence to the researcher's interpretation of events in Sumba. In return, these events further strengthen the theory. In conclusion, observation of the creation of an 'image of development' in Paberiwai is supported by and gives support to Scott's notion (1985: 321) that,

> "...it is the immediate interest of poor villagers to uphold the official realities in nearly all power-laden contexts. The partial transcript, taken alone, therefore, would create the impression of mystification. But we would commit the error of not realizing that mystification and impression managment are as much a pose of the powerless as ideological domination by the rich."

7.7 Conclusion

The agricultural system and livelihoods of ordinary farmers in the study villages have not been substantially improved by YTN's introduction of tree legumes and terracing. Due to pressures acting upon farmers however, they initially received these technologies and since then the rate of adoption has continually increased. Most of the force coercing farmers into adoption stems directly from government officials and local leaders. Nevertheless, probably unintentionally and perhaps even unwittingly, YTN contributed to this use of force by collaborating intimately with these institutions and more specifically by encouraging their members to involve themselves in promotion without providing any guidance as to participatory extension methods. This use and tolerance of force by government agencies, traditional leaders and YTN staff has occurred because it is in these parties' interests to promote the technology rather than meet recipient farmers' needs and desires. This is because those further up the hierarchy, such as YTN's assessors and government agencies beyond the village level, have also prioritised reception and spread of the technology above farmer satisfaction. Consequently, mere reception of the technology has been interpreted as an indicator of development for which those responsible for its implementation have been accorded prestige. This means ordinary

farmers have suffered because the welfare of an unproductive technology has been placed above their own. This is true; prioritising the welfare of the preferred technology has resulted in farmers living under the stress of coercion, it has meant that an opportunity for them to receive human development has been lost and it has meant that they have suffered materially because of extra demands made upon their labour by this non-productive activity. This is especially the case for the poorest who, in labour terms, cannot afford to work a traditional garden and at the same time create a terrace garden for the purpose of image. The introduction of YTN's technology however, has not been entirely disadvantageous for ordinary farmers. By appearing to adopt and embrace YTN's technology they have avoided what they find most frightening, resettlement. Without YTN's programme the pressures acting upon farmers may merely have been directed at getting them to leave their villages for the lowlands. The introduction and trial of this technology has in that sense given upland farmers a reprieve by allowing them to remain in their villages. Although unproductive, this is a genuine political advantage of the technology.



Plate 30: Forest yam (*Dioscorea hispida*) having been sliced and soaked in a stream to remove poisons, is dried in the sun, at Kawingu, Desa Katikutana. Farmers are dependent on this yam during the annual hungry season.

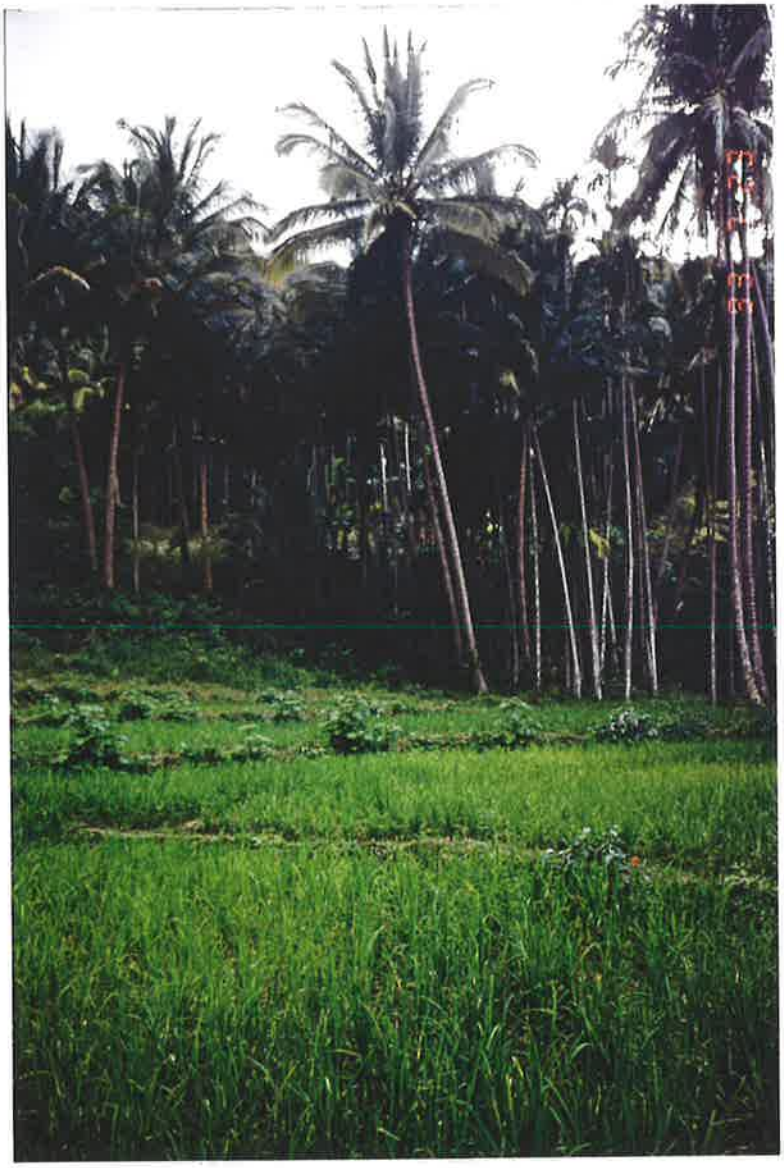


Plate 31: Having developed wet rice and a productive stand of coconut and areca nut trees around a spring, farmers of Tana Pingi in Desa Katikutana do not wish to be resettled.



Plate 32: The village complex of Ramuk is an impressive collection of large, corrugated iron roofed houses surrounded by a variety of horticultural and estate trees.

Plate 33: Bench terraces planted with tree legumes have been created at this garden in RK Ramuk (part of the village's central complex). The garden has been tilled and the legumes will be pruned later. As evidenced by this field, legume gardens are better maintained the closer their proximity is to the village complex.





Plate 34: In the centre of RK Ramuk, in the village complex, is one tethered buffalo which is fed grass and clippings from tree legumes.

Plate 35: The planting of tree legume hedgerows around the village complex is intense. However, as distance from the complex increases, the intensity of legume planting decreases.





Plate 36: A short distance from Ramuk's village complex, a garden with *lamtoro* hedgrows has been burnt in preparation for planting.

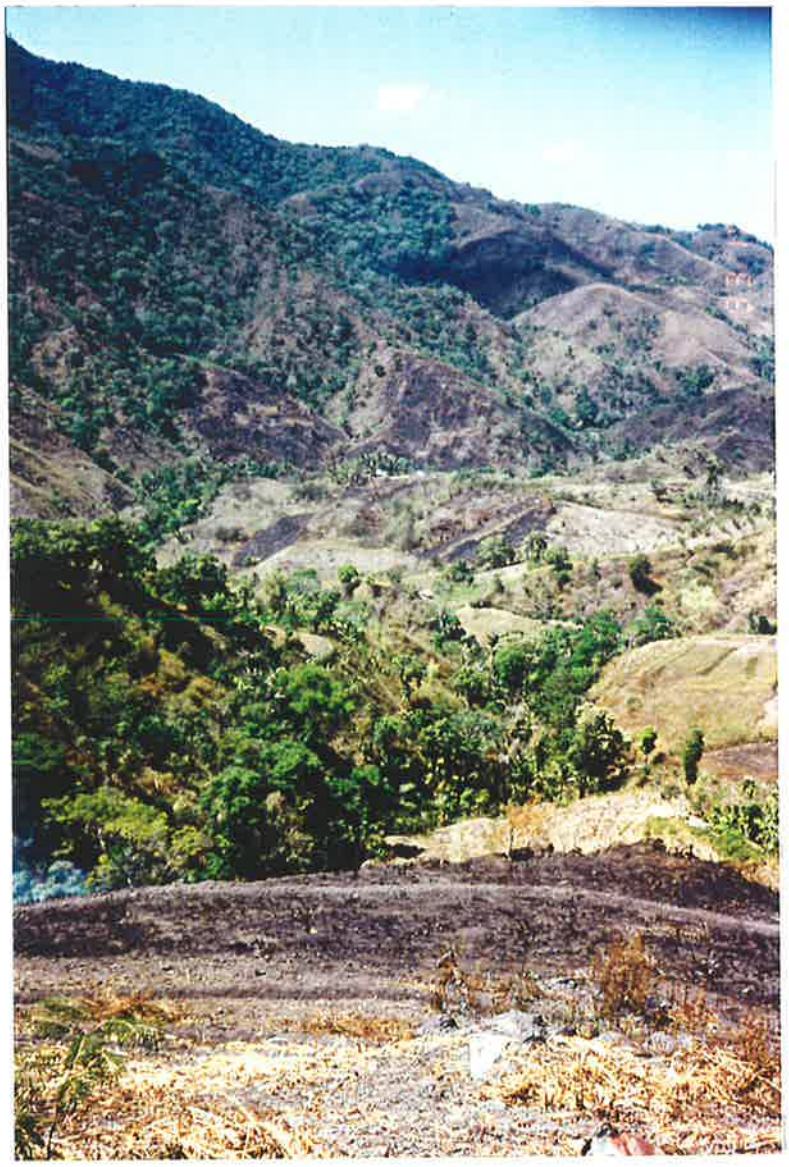


Plate 37: Around Ramuk's complex, patches of land have undergone controlled burning as farmers continue to find this a convenient method of field preparation.



Plate 38: Although the programme of YTN has been operative in Ramuk for more than a decade, food security has not yet been achieved. The resident of this house at RK Ramuk still finds it necessary to collect forest yams.

Plate 39: Trees and *Chromolaena odorata* have been slashed in preparation for burning at this site in Desa Ramuk, some four kilometres away from the village complex.



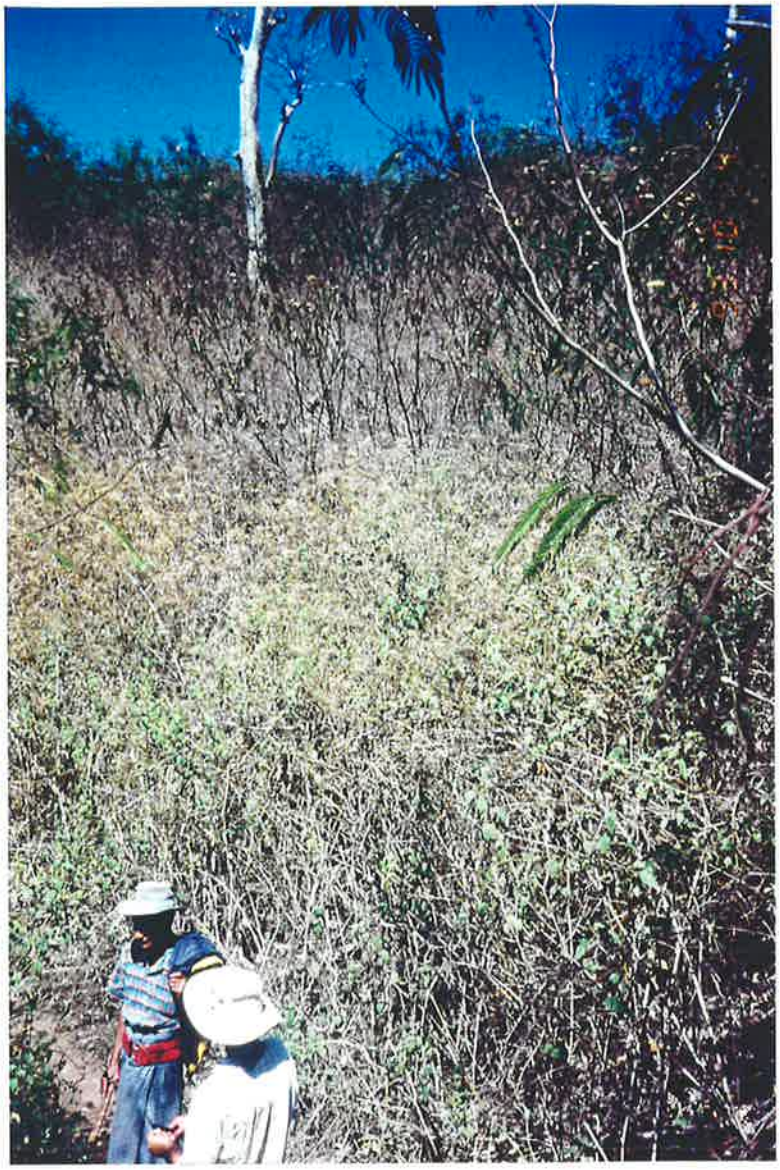


Plate 40: Abandoned fields of calliandra interspersed by fertile stands of *Chromolaena odorata* abound around the complex.

Plate 41: Concealed in the forest zone on the mountain slope above the community of Ai Rara, Desa Ramuk, shifting cultivation continues to be practiced.



CHAPTER 8

CONCLUSIONS

It is the duty of every man to develop others and disseminate propaganda, and perhaps the harsher one's methods the better. I might throw out an idea, a seed... From that seed might grow something real. What is there in that to offend them? At first they will be offended but then they will see that I have been of assistance to them.

(Andrey Semenovich in Dostoyevsky 1866)

...from frightened people you hear no sincerity, but distortion. You will not know whether the praise uttered by a frightened man is authentic praise or merely boot licking.

(Gunawan, in **Tempo**, 22 June 1991)

8.1 Introduction

Yayasan Tananua's experience in East Sumba, reveals NGOs' abilities and potentials in the development process, both within East Nusa Tenggara and in similar environments generally. YTN/WN experience is significant because their programme is one of the longest running in all NTT. They also have a relatively large number of followers located over a vast area. Throughout this area, YTN has worked in an environment characterised in social terms by the continued dominance of traditional culture and in physical terms by significant microclimatic diversity. These characteristics typify most of the province's rural districts, thereby enhancing the applicability of YTN's experience. YTN's purported success with its technological and methodological innovations has already led to it being revered as a model to which other agencies should aspire. It is therefore appropriate to draw from this study's interpretation of YTN experience, a number of conclusions on NGOs and relate these to general theories

concerning their role in the development process. These conclusions do not distinctly or substantially alter this general theory. Such alteration could only result from objective analysis of numerous organisations' experiences. Instead YTN's experience merely refines that part of the theory relating to NGOs with similar aims, structures and scale, and working in like environments to YTN itself. This can give direction to other agencies in comparable situations.

This conclusion concentrates on three major issues that are important to the general theory of NGOs in development, about which YTN's experience provides some insight. First, is the actual freedom of NGOs from policy and financial ties. Second, is the ability of NGOs like YTN, to achieve institutional reform via collaboration with state agencies. Finally, earlier statements on the invalidity of using participatory approaches to promote preconceived technologies are reiterated and expanded. It is shown that problems experienced by YTN with regard to these issues are related to those factors minimising the degree of participation in their approach. After presenting conclusions on these issues, and hence having espoused the lessons to be learnt from YTN's programme, particular recommendations are drawn from the study to assist YTN's programme in the future. These recommendations discuss in particular, the possibility of mixing participation and force in future initiatives.

8.2 Lessons arising from YTN's experience

8.2.1 Freedom of NGOs from policy and financial ties

YTN has not been able to fulfil the wishes of individual farmers in East Sumba. This is even though the organisation has aimed at using a participatory approach. Similar to other agencies, including those of government, YTN has been constrained by pragmatism and practical realities. It has been limited by its need for survival the same as any other organisation, be it public or private. As YTN has remained financially dependent upon WN it has been more responsive to its donor's desires than those of its recipients. It has generated results that are

consistent with WN's perceptions of success to guarantee future funding. It has appeased WN and conformed to their perceived images of physical development. YTN has not served farmers' interests by generating site specific models consistent with their desires and needs but instead has promoted the 'one proven technology' model preferred by WN. This compulsion has been worsened by WN rewarding YTN's loyalty by increasing the latter's resources and prestige. This has allowed and encouraged YTN to generate a significant bureaucracy. In turn this has added to YTN's conservatism by increasing the stakes if the agency fails to achieve results and maintain funding.

YTN's behaviour is consistent with the comments of Porter *et al* (1991) recorded in Chapter 2. He asserts that NGO's fear reporting bad news or problems because this threatens funding from donors. YTN's apparent desire to protect a growing bureaucracy also supports Brodhead's (1987) view that small projects are a limiting form of NGO activity. YTN's ability to adapt to locational differences has been constrained by the rigid programme, their bureaucracy and by the specialist skills that they have developed at both organisational and individual levels. In saying this, there is no indication that Brodhead's alternative method of operation, where NGOs merely act as bridges between recipients and existing services, would be an outright success either, considering Paberiwai's isolation and almost total absence of existing services.

Related to YTN's inability to break from economic imperatives at the organisational level is the behaviour of individual staff members. YTN's staff have not demonstrated exceptional freedom of action nor innovation. Contrary to the theory YTN's staff are closely scrutinised by the agency and they are not motivated by altruism. They do not foresake large wages nor alternative careers to work for the agency. In fact, instead of making sacrifices, local people working for YTN receive an extraordinary opportunity. They enter an organisation that pays wages comparable to public sector employees and which has realistic channels for promotion and thus, upward mobility. Although the money received by YTN extension officers is an altruistic payment by western standards it is a professional wage in Sumbanese conditions. Upon accepting these opportunities, staff are understandably concerned to maintain them, and

this creates immense burdens of conformity. This burden is intensified by YTN's expectation that employees will adequately satisfy commonly achieved targets. Internal peer group pressure makes it clear to staff that further opportunities for them in the agency, and even their short term continuation with the organisation, will be jeopardised if these expectations are not met. A similar fate faces those who do not implement the programme as externally conceived by WN. Therefore, consistent with the observations of Brett (1993), the payment of a 'reciprocity' wage to NGO staff creates a relationship between the organisation and staff that demands scrutiny and results. This inhibits freedom and innovation.

In WN's case, it has been conscious of promoting its own ideology. It has done this to prove its ideological superiority in terms of preferred technologies and approach. Therefore, WN/YTN staff have not been constrained by their operational environment but by the greater organisation's own policy agenda. This agenda emphasised commitment to one type of technology which was thought would benefit the environment and recipients. WN hoped that this technology, if it reached its potential, could reinforce their development paradigm by showing that rural development was achieved by increasing agricultural productivity through the selection and facilitation of appropriate technologies. This was in contrast to aiming generally at recipient welfare and human development. Consequently, the organisation was not receptive to farmer input if it meant significantly altering their preferred technology. In addition to ideological superiority, WN's desire to justify its approach and paradigm is accounted for by its general economic need to achieve an image of success as well. It must secure funds from its donors, be they individuals or other GOs and NGOs. As Burnell (1993) indicates, recent trends in NGO funding suggest that finance is becoming more difficult to obtain, as the NGO market becomes more competitive. Moreover, as shown in Chapter 4, NTT's NGO sector is already very competitive.

8.2.2 Ability to achieve institutional reform via collaboration with state agencies

Chapter 1 noted that technical factors were often major constraints to tree-planting's success. Such constraints included a lack of tree maintenance due to minimal technical knowledge and an absence of support services to recipients. YTN's village based extension service has helped overcome these problems and has also been highly effective in securing initial adoption of tree-planting. A large part of this success has been due to collaboration with local government and the village elite. Members of these institutions have been used to communicate YTN's messages either as staff members or as external supporters of the agency's activities.

However, while this collaboration has enhanced the influence of YTN's message amongst recipients, it has not achieved the theoretical advantages thought possible. In YTN's case, collaboration has increased the technical capacity of the agency but it has not led to institutional reform in local government, nor for that matter in traditional Sumbanese social institutions. It was hoped that when those in existing institutions observed the NGO's example they would be inclined to follow. In the field however, YTN's approach was uninfluential and little evident. Most of their success in facilitating adoption of tree-planting was achieved through the use of traditional techniques by those in existing institutions. Members of the local government and local elite contributed most to adoption by using their traditional methods of influence which are heavily reliant on force. Without this involvement the levels of adoption achieved would not be so significant. As has been recognised by YTN personnel themselves, where local leaders are not prepared to support the programme, adoption and interest declines.

Indeed, the opposite occurred to what was hoped. Some NGO staff at the village level were attracted to the coercive approach of existing institutions because it was able to achieve the results demanded by WN/YTN. This eventuated because while WN/YTN have asked their staff to use a new approach, the organisation still emphasised the achievement of target-oriented results. For staff to persevere with a genuine participatory approach, and not tolerate

the involvement of experts in coercion, it must be recognised that results will be different in accordance with the means used. In particular, results will be achieved much more slowly. This must be communicated to staff, observors and donors. Bunch (1982) makes it clear that results will come slowly. However, his message has been lost on YTN staff who tolerate forced adoption by members of the government and the elite in order to generate adoption rates significantly higher than those ever expected by Bunch himself. This adoption follows a pattern that casts doubt over the notion that it could ever have been generated by participatory means.

Therefore, the source of YTN's inability to achieve institutional reform is its emphasis on results rather than process. This is to be expected as YTN has been rewarded for number of adopters achieved rather than undergoing rigorous examination of its participatory approach. In its desire to attract adopters at all costs YTN has established an approach to tree-planting that is hierarchical and reliant on existing institutions. It therefore, does not reform these institutions but reinforces them. By recruiting local leaders to central positions in the organisation (and to supporting roles outside of it) and by tolerating a degree of coercion, YTN reinforced the authority of these individuals and their means. This is unfortunate for ordinary Sumbanese because many of their worst problems are caused by social institutions like the household, marriage, and the system of slavery, which are in turn perpetuated by the institutions controlling them such as the local leadership. These institutions would be very difficult to change. YTN however, does not even attempt to amend them. Instead it validates them by recognising their power for the purposes of tree-planting promotion. Thus, YTN reinforces the rule of the local elite by giving preference to its technology over the welfare of recipients. The technology's future is placed above institutional reform. This is for self interested reasons because promoting a physical technology is politically benign and an immediate and visible indicator of success.

The ultimate result of YTN's involvement with government is that it is perpetuating poor conditions for ordinary farmers, especially women and slaves by giving further power to those who oppress them. It is also apparent that in the process of collaboration the government

has had more influence on the NGO's staff than *vice versa*. YTN has merely adopted a role whereby it provides technical expertise but does not contribute to the theoretical approach used. This means there has been a reversal of roles from those perceived in theory. Indeed, many of the theoretical fears of NGO/government collaboration have eventuated in YTN's case. It has been difficult to adopt a rural poor focus, collaboration has negatively influenced the NGO away from participation and the government has been inclined to interpret the relationship as one primarily of service provision.

8.2.3 Participation's role in tree-planting

YTN's experience gives crucial insights into the circumstances in which it is valid to try and use a participatory approach. In addition to YTN, there are many organisations and theorists who are passionate about the potential of agroforestry systems. Commencing with a desire to promote these tree-planting systems, these groups turn to participation as the means of extension. As initially conceived, this study also aimed to examine how tree-planting could be promoted. It seemed that everybody pointed to pariticipation. However, this conception is flawed. Participation cannot be used in this manner. To constitute a genuine participatory approach, participation must be a part of the process before technology selection occurs. If intended recipients do not participate in technology selection then the process has been corrupted before it has had the opportunity to get underway. Nevertheless, this is an all too common scenario because participation is not used for participation's sake as a process of empowerment. Instead the discourse of participation is adopted but there is merely an intent to use it to fulfil predetermined political and ideological agendas.

It may not be realistic however, for NGOs aiming at service provision to commence a project without first having a technology that is favoured by donors. This is because individual donors and the parent organisation itself may be reluctant to fund a technology that they find unfamiliar or inconsistent with their ideology of development, regardless of whether it is

attractive to recipients. Often a renowned technology is required to generate attention and funding for the programme. There are two ways around this problem. One is by conducting longer, more intensive preparatory projects. These projects could identify recipients' needs and desires, generate technologies that are appropriate and then request further funding. Alternatively they could identify those areas where preconceived technologies were really most appropriate. Judging from an absence of WN/YTN documentation, significant preparatory projects were not conducted in Sumba. There were no surveys of farmers' conditions and thoughts and no baseline data acquired. Instead there was a preconceived opinion of the value of terrracing and hedgerow intercropping and then a dubious analogy drawn from *Lamtoronisasi* in Sikka, on the island of Flores. As the people of Sikka had already planted tree legumes on a large scale and because the Sumbanese made simple terraces by piling rocks or laying logs in their fields, it was presumed that it would be a natural step for the Sumbanese to construct earth terraces, plant tree legumes and then intercrop those legumes.

It is nevertheless important to remember that YTN's experience says just as much about force as it does about participation, if not more. It is not possible to say that the use of a participatory approach in Sumba would have enhanced the quality of adoption of the tree legume technology because recipient participation was undermined the moment that WN preconceived the technology. It was then further devalued when that technology was doggedly adhered to and not modified consistent with the thoughts of recipients. The following contains recommendations for the programme of YTN. It is suggested that perhaps one of the lessons from YTN's experience is that in the actual, competitive world a genuinely participatory approach is unrealistic. There is perhaps a place for pressure and force that needs to be recognised and tolerated.

8.3 Recommendations for the programme of YTN

8.3.1 Need for recommendations

Previous chapters have critically assessed recipient participation in YTN's programme. Some say criticism of this nature is easy. However, it is not easy, and criticism for its own sake was not this work's purpose. Conducting research of this type and generating frank results that may cause offence is very difficult. People In Sumba who assisted the research by giving information may feel betrayed by what is said. However, for the benefit of ordinary farmers in Sumba, it is important that what is reported is consistent with what was observed. For it is these farmers who are suffering under pressure and coercion. They will be the ones most disadvantaged if the myth of YTN's technology continues to be popularly accepted because they bear the burden of maintaining its successful image.

Nevertheless, despite the intentions of the critical assessment made so far, one must still provide recommendations of use to YTN and other NGOs in similar circumstances. As Postman (1992: 181) accurately states, "Anyone who practices the art of cultural criticism must endure being asked, What is the solution to the problems you describe?". Although actions that YTN could take are already observable from the foregoing discussion, the purpose here is to summarise those recommendations into their most digestible form.

8.3.2 Variations between reality and principle

At present there is significant disparity between the planned implementation of YTN's programme and what is actually done in the field by the agency's staff. Related to this, there are differences between the organisation's principles, as determined by senior staff, and recipients' understanding of these principles, as communicated to them by field based staff. These inconsistencies are apparent in varying interpretations of *bakar sopan'* (controlled

burning). Senior YTN staff say that this activity is permitted but recipient farmers, basing their opinions on information from field staff, do not share this view. Disparity also occurs where YTN principle says that horticultural trees may be given to anyone while recipients have experience suggesting they are only given to those who have planted tree legumes.

These and other disparities will only be recognised by those at higher levels in the organisation if they conduct more intensive and honest assessments of field activities. Assessors must be more questioning and less willing to rely on comments made by local people who have a vested interest in the programme's continuation. Assessors must investigate at all levels and at all times, variation between the discourse and the actuality of activities conducted. Variations between principle and practice will only be ascertained by programme assessors when they observe what is happening in farmers' gardens. What farmers say should not be relied upon in isolation. There should also be greater monitoring and assessment of field staffs' statements to recipients. It is at the level of field staff that agency principles are often distorted to enhance both results and the reputation of the staff member responsible for particular recipients. The incentive driving field staff to distort principles will be eliminated at its source by reducing emphasis on quantitative success.

8.3.3 Reassessment of the use of alleycropping as the primary technology

YTN needs to reassess its promotion of alleycropping as their programme's primary technology. Problems with alleycropping technology, experienced by recipient farmers, need to be further investigated and articulated. At present they are brushed over in the organisation's eagerness to generate an image of success. Alleycropping has contributed little to the improvement of recipient farmers' livelihoods. It has made minimal real contribution to field fertility while at the same time substantially increasing farmers' labour burden.

By acknowledging alleycropping's shortfalls YTN will assist farmers by providing them with potentially more productive alternatives. It will also prevent them from being restricted to the cultivation of infertile, certifiable land alongside Paberiwai's main roads. YTN's persistent advocacy of alleycropping has encouraged the regional government to state that, because of this technology's productivity, there is no longer any justification for farmers not to abandon shifting cultivation and take up certifiable land by the main road. This will cause immense hardship for farmers given the reality of alleycropping's productivity. The situation will be made worse by the relatively small area of certifiable land distributed by the government. As alleycropping is puported to result in increased yields and ultimately permanent agriculture the government allocates land to farmers that is inadequate for a subsistence yield and does not permit field rotation (which is inevitable with any cropping system given Paberiwai's marginal soils). Consequently, YTN may be doing farmers a disservice if its unsupported promotion of alleycropping results in the government restricting them to small areas of land on the tops of Paberiwai's infertile ridges rather than relocating them from the mountains to expansive, irrigated tracts of land in areas like Kakaha and Kambaniru.

8.3.4 Reducing the source of pressure; revising donor's expectations

Donors must reduce the source of pressure on YTN and its field staff that leads them to ignore farmers' desires and seek out methods for increasing the rate of adoption. For this to happen field staff and YTN's hierarchy must receive a new message from donors. It must be reiterated to all levels of YTN staff that slow progress is tolerable and that physical development is not the major priority. For this to occur donors must desist from rewarding YTN for quantitative success only. There must be recognition that Bunch's approach has been abandoned because of a focus on quantitative success in a competitive environment. There is now a need to reduce expectations and facilitate greater appreciation of examples of high quality adoption, even though they may be few in number. If donors reward quality rather than quantity then this ethic will be passed on to YTN staff members.

8.3.5 Return to basic principles and incorporate some innovation

YTN's approach has not been successful in achieving either participation or human development. As intimated above however, this failure should not reflect badly on Bunch's approach. This is because the actual approach implemented in Sumba is significantly different. Bunch's approach involved a single technology being promoted slowly. In contrast, the approach used in Sumba has emphasised a single technology being adopted rapidly and expectations that after initial adoption the rate of reception would increase even further. Although Bunch's basic principle of promoting just one technology across a range of microclimates is flawed, this principle's limitations have been worsened by the reality of YTN's approach. By speeding up the process of adoption, and reducing the period of experimentation and verification of the technology on extensionists' fields, YTN has promoted an unproven technology. That the single technology be proven is crucial to Bunch.

It is to YTN's immediate advantage to return to the familiar principles of Bunch. YTN must prove the technology in extensionists' fields first and then use this success to inspire farmer adoption. The rate of adoption must be kept to a natural pace (which is perceived by Bunch to be slow) and adoption should be restricted to only those who are genuinely interested. Since YTN's inception this has not occurred. There has been much emphasis on quantity of adoption and spread into new villages. New villages have often recorded 40 to 50 adopters in their first year and 80 to 100 in their second year. Staff have concentrated on promotion via collaboration with local officials without actually proving the technology in their own gardens. Indeed, most do not even have gardens. Nevertheless, YTN's success and failure has illustrated other aspects of an approach to tree-planting that could be incorporated into Bunch's original approach to make it more effective.

8.3.6 Alterations to the Bunch approach

a) Increase the preparatory phase

An improved approach resting on Bunch's basic principles would have a greater preparatory phase. This phase would include a substantial consultative process with all factions of each community that the programme enters. This would increase participation in the approach. It would also enhance the chances of success of the one single technology initially introduced because regardless of the technology's productivity, it would be consistent with recipients' desires.

b) Mix participation and pressure, to utilise force and overcome problems presented by collaboration

Returning to Bunch's principles would de-emphasise the achievement of quantitative results. This would reduce the need to achieve targets and hence release the programme from dependence on force. Attention would then have to be given to modifying the current form of collaboration that YTN has with village elites. To consciously revoke the existing relationship with the village elite to reduce the use of force in promoting YTN's technology requires much care. YTN must reduce the existing forceful role of the elite in promotion but it cannot neglect or offend them. The continued strength of traditional leadership means that their approval must still be obtained if a project wishes to operate in a particular village. Similarly, getting leaders to merely follow a programme, rather than actively promote it, is still very useful in winning the trust of other inhabitants.

In terms of the nature and management of the relationship with the village elite, two issues arise. The first concerns whether a programme could exist at all in Sumba's villages without the active collaboration of the elite occurring at present. YTN's experience suggests that village leaders can accept and tolerate a programme without being actively involved in its

promotion. In Mehangmata for example, the village elite approved of YTN's programme but did not engage in active promotion. The village head did not bother to carry out inspections of farmers gardens and this was used by a YTN extension officer to explain why adoption was so slow in this village. In this village however, the programme still proceeded even though growth in adoption was very slow. The rate of adoption was not unacceptable when compared to the expectations of Bunch.

A second issue however, is whether the leaders of particular villages would be able to leave the programme alone and take a passive role, considering their dominant roles in all other aspects of village affairs. Although YTN may wish to reduce the involvement of forceful members of the village elite, they may not be prepared to take a back seat. This is especially so when they have their own aims, such as staving off resettlement. This is a valid concern that could well emerge. In such circumstances YTN could only try and communicate with these leaders and express to them the agency's goals and the importance of slowing the rate of adoption to achieve long term benefits. YTN has ultimate control over the situation in any village because it alters the flow of resources to that community. If adoption occurs as a result of coercion then YTN can merely refuse to continue providing resources to the village. By punishing coercion, rather than rewarding it as occurs at present, it can be discouraged.

However, perhaps YTN should not try and eliminate the use of force altogether. YTN's experience has already identified significant problems with a force approach. Forced adoption results in poor quality adoption and maintenance of the technology decreases further over time. This stems from the inability of the programme responsible for promoting particular technologies to adapt to particular situations, problems and needs confronting recipient farmers. Due to the incompatibility of the promoted technology with the situations of farmers they only adopt to the extent that they are forced. According to Scott (1990: 109-110) in these circumstances peoples' conformity expires at the moment the intensity of force relaxes. Nibbering (1991: 129) also argues that a force approach is not sustainable in the long term. He says that this sort of approach may be effective while levels of education are still low and when

people are afraid not to conform, but in the future, as education levels increase, so too does freedom of thought and independence.

Nevertheless, YTN's experience has shown that the use of force can still have some advantages. For instance, pressure from village leaders resulted in a significant number of adopters in a short time. Although fields were being abandoned almost as quickly as the technology was being adopted, this could merely result from poor technology selection. If the technology chosen was consistent with farmers' needs and productive, then the force approach may have succeeded and done so in a shorter time frame.

It may thus be possible to combine the use of participation and pressure and hence, reach a balance to achieve optimal results. Force would be used to optimise its advantages but in particular areas participation would be preferred to eliminate the former's disadvantages. Utilising force means that the power of the elite would be harnessed. Incorporating it into a programme gives organisers a degree of control over its use which they would not have if it was shut out entirely and ignored. Force is an inherent component of the traditional societies of East Nusa Tenggara. Rather than pretending that the coercive nature of existing institutions does not exist, the reality of force's presence must be acknowledged and accepted so that methods of using it constructively can be developed.

Of course using a force approach means validating the institutions from which that pressure emanates and therefore, possibly perpetuating subordination to those institutions. However, if force is promoting a truly appropriate technology the economic development originating from this approach would lead to a process of empowerment that would place recipients in a better position to overturn these institutions themselves. Traditional institutions characterised by force would only be used while people remain traditional. As they develop and respond less to these institutions then other institutions characterised perhaps by reason and example would become more influential. While force is most influential however, it must be harnessed and cannot be ignored.

A combination of the two approaches would continue to emphasise a participatory approach to technology selection and assessment reliant on a consultative process assessing people's needs and experiences. This is essential so that proven, appropriate technologies are chosen in the first instance and so that mistakes in technology selection are identified and quickly changed. Technology promotion however would then be done with the assistance of force, rather than being left to individual decision. This would allow a high number of adopters to be achieved because NTT is a traditional environment where people continue to follow their leaders' commands. Giving a defined role to force may be justified not only by the speed with which it attains results and the peril of leaving it to operate unharnessed, but also because initially people may not appreciate the technology's value or may be reluctant to try it because of their inherent conservatism. It could be said that it is only through some coercion that recipients can grow to like and accept a technology, after this has occurred then they will see that it has been to their benefit. Regardless of the use or impact of force however, the most crucial component is that the agency ensures that the technology on offer is consistent with recipient desires and needs in the first instance. Before promoting any technology there must be sufficient investigation and detailed preparatory projects that emphasise participation.

Appendix A: Methodology Question Schedules

1. Question schedule directed at programme coordinator and supervisor of Yayasan Tananua (after three informal meetings with these officers this interview occurred on the fourth meeting);

Location
1 Why did your organisation commence activities in this Kabupaten and not in others in this province?
2 In which Kecamatans does your organization have development activities at present? Which ones in the past?
3 In which villages?
4 In which year did you commence activities in each village?
Technology and its selection
5 What sorts of tree-planting activities are conducted by your organization in those villages? What other types of activities?
6 How were those tree-planting technologies which you are promoting selected?
7 Have people been questioned as to their needs and desires? Have they been asked what they think of trees and new technologies? If yes, what was their reply? If not, why not?
8 Has there been a preparation project to trial technology now being promoted? If yes, what did it involve and how did it go? If not, why not?
Implementation
9 How were the locations in which your organization is operating chosen for those activities? What criteria were used?
10 In East Sumba are there any villages with larger need than other villages?
11 What are the main problems faced by people in these poor villages?
12 Do the villages selected by YTN include locally poor ones (those with a larger need)?
13 Do you know of any other poor villages or those with many poor groups living there? Why were these not selected?
14 What groups of the community are among the poorest in the selected villages? What are the characteristics of a typical household in this group?
15 Have you noticed of the households following YTN activities anything which they have in common?
16 What plans does the NGO have for implementing the chosen technology?
17 For how long is assistance given to individual households and particular communities?
18 Do local people in the selected villages work for your organization in paid or voluntary positions? What is the nature of their work?
19 We have noticed that many of your staff in the villages are very young, why is this? Does this have any advantages or disadvantages for your organisation?
20 Do your staff come from other countries? From other provinces? Are they paid or are they volunteers?
21 What do those people willing to engage the activity that your organization is promoting have to provide? For example, are there any conditions such as having to devote a certain amount of land to tree-planting, guaranteeing to work with the trees for any particular period each day?
22 Do the people wishing to engage in your project have to pay back anything at any time to your organization? If so, what? Are the benefits which they extract by implementing your activity solely for their own use or do they have to be divided in some way?
23 Who are your donors? From where do you generate funds? Are these sources local or foreign?
24 Do you generate funds from a local source? Do you generate funds from your recipient communities? Do you have plans to initiate extracting funds from a local source?
25 Does YTN plan to continue expanding its activities to new communities or will you intensify activities in villages already served?
26 How do you see your role in relation to and your relationship with government development agencies?
27 What are your hopes and fears for this organisation?

Rationale behind the above question schedule -
-Questions on location allowed project villages to be located so that objective, independent analysis of their situation could be made.
-Questions on technology and its selection investigated whether planned recipients were asked what they wanted and whether their needs were gauged. This indicated whether the NGO used a participatory approach in technology selection. It also indicated the likelihood of adoption of that activity, with farmers less inclined to adopt something that they had not requested.
-Questions regarding implementation determined whether the NGO deliberately set out to target the poorest farmers and whether they succeeded in their aim. If the NGO focussed on the poorest this supported the notion that they made attempts to engage participation. If the NGO did not engage the poorest, questions gave some indication of who and where the poor were so that reasons why they were not targeted could be uncovered.
-Other implementation questions probed at the degree to which the NGO encouraged participation by its recipients. Questions on operation examined the issue of NGO autonomy another potential problem area according to the literature.
-All of the above questions were designed to generate baseline information about the NGO and its tree-planting activities. If the NGO had a participatory approach these activities should have been generated through examination of the situation of local poor people. If these people were not supporting the NGO's activities, then this either suggested the NGO had failed to gauge what local poor people want and need (raised serious questions about NGO's ability to implement a participatory approach) or that there were other constraints which discouraged people despite the NGO's efforts.

2. Question schedules directed at government officials at the Regency level of East Sumba,

The following is a copy of the form presented to government officials with intimate knowledge of Kecamatan Paberiwai and Kecamatan Tabundung. It helped to assess the overall condition of villages in these Kecamatan (borrowing from Holloway's method which was designed to be used by BAPPEDA field staff in determining the relative well being of villages in their area).

In the English language the form took the following shape;

ASSESSMENT OF VILLAGES IN KECAMATAN PABERIWAI

RESPONDENT: ..... (name of relevant govt. office)

QUESTION: ..... (one form per question)

VILLAGE NAME	ASSESSMENT
1	LOW 1 2 3 4 5 HIGH
2	LOW 1 2 3 4 5 HIGH
3	LOW 1 2 3 4 5 HIGH
etc	

* 1 = Low
2 = Less than enough
3 = Enough
4 = More than enough
5 = High

Village name above included a list of the names of every village in Kecamatan Paberiwai.
One of the above forms was used for each question asked; the form remained consistent for each question at each different office.

On an adjoining page the following space was provided for explanations (see overleaf);

If you answer less than enough (2) or low (1) for any village, please indicate why this is so;

Village Name: .....

Explanation: .....
.....
.....
.....

Village Name: .....

Explanation: .....
.....
.....
.....

etc

Questionnaire schedule for the Village Development Office (BANGDES),

1 In your view, what is the general level of productivity in each village in Kecamatan Paberiwai (in fields such as food crop and cash crop production, livestock, fisheries, forest products, industry, mining, etc)?
2 In your view, what is the general level of infrastructure provision in each village (for example provision of school buildings, roads, other transportation and communications infrastructure, distance to health clinics and markets, provision of water for domestic and agricultural purposes)?
3 In your view, what is the living standard and income like in each village of Kecamatan Paberiwai?
4 In your view, what is the capacity of the population in each village to fulfill its basic needs (food, housing etc)?
5 For each village, how easy is it for people to obtain income earning opportunities which will yield an adequate return?

When respondents recorded less than three for any particular answer in relation to any particular village they were asked to specify reasons for their answer.

Question Schedule for informal interview with the Village Development Office (BANGDES);
1 What is the role of BANGDES in village development?
2 What approach does BANGDES use to implement its plans? Can you outline this approach?
3 What are farmers' major problems in Kecamatan Paberiwai?
4 What trees do farmers traditionally utilise?
5 What is the land situation of farmers like in Kecamatan Paberiwai? Do they have enough land to crop? What is the strength of their title to land?

Question Schedule for informal interview with the office of the regional planning body at regency level (BAPPEDA);
1 What is BAPPEDA's plan for activities in Kecamatan Paberiwai in the future? What activities have occurred there in the past?
2 Are there any significant differences in potentials and productivity of any particular villages or areas?
3 What are the most serious problems facing farmers in Sumba at present?
4 What tree-planting technologies have been used? If any, what has the success of these technologies been like?

5 What tree potentials are there here? What trees are particularly suited?
6 What areas are particularly suited to tree-planting?
7 How many NGOs are operative in East Sumba?
8 Have you had any probems in the coordination of these NGOs?
9 Why do you think that Yayasan Tananua commenced activities and succeeded in Desa Ramuk?

Questionnaire schedule for officials of the Agriculture Department (including Agricultural Extension section, Food Crops and Horticulture section and Estate Crops Division);
1 Based on information available to you, what is the overall level of productivity in each village?
2 Based on your data or estimate what proportion of households own land?
3 What is the level of prosperity (income and wealth) of the population in each village?
4 What is your assessment of each village from the point of view of the proportion of farmers with access to adequate resources (land, boats, tools, etc)?

Again, when respondents recorded less than three for any particular answer in relation to any particular village they were asked to specify the reasons for their answer.

Question schedule for informal interviews with officials of the Agriculture Department;
General questions
1 What do you think are the priority needs of resource poor farmers?
2 If farmers were to be encouraged to plant trees on their own land, such as fruit or fodder trees, what factors do you think, stemming from either the environment or the farmers themselves, may inhibit such an activity?
3 Can you think of any examples where farmers have been encouraged to plant trees? What were the experiences of this project? What problems did it encounter? Why did it succeed? Or fail?
Specific questions then related to the activities of the respondents' respective section in the study area and their experience and coordination with the NGO.

Questionnaire schedule for Social Welfare office;
1 In your view, what is the level of quality of housing in each village?
2 In your assessment, what is the level of food consumption (quantity and quality) in each village?
3 In your view, for each village, what is the availability of adequate income earning opportunities?
4 In your view, what is the level of poverty in each village?
5 In your view, what is the proportion of poor people living in each village? (1 for many poor, 5 if few poor)

Unfortunately there were no staff at this office with sufficient experience in the isolated Kecamatan to respond. Informal discussions with staff thus concentrated on the current plans of the office, one of which was to take part in the local Transmigration project from Kecamatan Paberiwai. This agency relys on the reports of other departments and to date has little experience in the study region itself.

Questionnaire schedule for the Forestry Department;
1 What is your assessment of each village from the point of view of the proportion of village people with access to forests and forest resources (eg: timber, other non-timber forest products, hunting grounds perhaps)?
2 How would you describe the amount of each village's land which is devoted to community forests? (Community forests being defined as those planted on community land intended to benefit the community as a whole).
3 How would you describe the number of farmers growing significant numbers of trees (in any configuration) on their private land, in each village?
4 In your opinion, what is the level of prosperity (income and wealth) of the population in each village?

Again, when respondents recorded less than three for any answer in relation to any particular village they were asked to specify the reasons for their answer.

Question schedule for informal interview of Forestry Department staff;
Information as regards people's access to tree resources and their relationship to trees was considered a vital priority when dealing with the Forestry Department;
1 What types of forest are prevalent in Sumba Timur? For example, protection forest, conversion forest etc? In Kecamatan Paberiwai? (maps?)
2 Do local people have any activities in remnant (protection) forests? If yes, what sorts of activities do they conduct in protection forests and what uses do they have of those forests? If no, how are local people discouraged from entering into protection forests? Why are they prohibited from entering?
3 Do local people have remnant forests that they are permitted to use other than protection forests? What are these forests categorised as ?
4 What uses do they have of these forests and what activities do they carry out in them?
5 Does the Forestry Department here have any programmes encouraging farmers to plant trees? For example, social forestry? If not, why not?
6 Can you give some detail as to the nature of these activities?
For example, What sorts of land are they encouraged to plant? (government, private, communal) What rights do farmers planting have over this land?
What sort of trees are they encouraged to plant? (timber, fruit etc)
What incentives are used to motivate farmers to follow the activity? What is given to farmers to get them to participate? Or what type of activity is done to motivate them?
What rights do farmers have over trees once they are planted? Are they government trees or for village or private use?
What sort of labour requirement does the programme demand of farmers? How much time must they commit to the programme? (Is it up to them? Or are they compelled to devote this much time?)
What sorts of farmers are engaging in the activity? (Socio-economic groups) Is there any particular reason why these types of farmers are participating?
Are there any problems when trying to encourage farmer participation?
How would you describe the success of these tree-planting programmes?
7 Do you know of any other groups government or non-government that are encouraging farmers to plant trees?
8 Can you describe the nature of their activities (briefly)? And general location?
9 In your opinion, what do local farmers most need trees for? What do you think farmers want trees for? Are their needs and wants different?

3. Question schedules for village leaders and other key informants during initial visits to study villages

a) Question Schedule for village leaders and other key informants in villages which are NOT engaging YTN activities;

I. About the Village
1. What are the major occupations in this village?
2. What other work do people do?
3. Are there different occupations in different hamlets? If yes, what differences are there?
4a. Do many people go away from here, either temporarily to work, as casual labourers, as seasonal migrants etc?
b. Where do they go?
c. Why?
d. Who goes?
5. How many families have members who work for wages? What are these people's main occupations?

6a. Of the farmers here, how many families own irrigated land?

b. How many families cultivate irrigated land on a share crop basis?
c. How many families own dry land or small plantations?
d. Is cultivation permanent or shifting?
e. How many families cultivate dry land or small plantations on a share crop basis?
f. How many families own no agricultural land?
g. How many families neither own nor cultivate land?
h. What are the staple foods here? What do people eat when they run out of these staple foods before the harvest?
i. About how much land does an average family here need to supply all their staple foods? And about how much do they need to supply all their needs?
j. About how much land can a particular family here cultivate in one season, if it works as usual?

7a. What livestock do people rear here?
b. Is livestock rearing an important occupation?
c. Why do people here raise livestock? (eg: sale, draftpower, food, celebrations, etc)
d. Are there any problems with livestock here? If so what problems?

8a. What village products are sold to people outside the village? (eg: agricultural produce, livestock, handicrafts etc?
b. How are these products marketed? That is, who sells them? who buys them? and from where?
c. Are there any problems with marketing? If yes, what problems?
d. Are there any problems with transportation? If yes, what are they?
9a. How far is it to the nearest Kecamatan market? How do people usually get there? How long does it take to get there, walking? by public transport?
b. How far is it to the nearest Health Centre or Health Station? How long does it take to get there, walking? by public transport?

10. Where does the water supply come from here? What is the water supply's quality like? For drinking and cooking? For bathing and washing? For crops?
11. What health problems are there here? What illnesses are common? Are there many people here who are disabled or who cannot work as usual because of injury?
12a. What problems does this village have?
b. What resources are there here which could be developed?
13a. How many families do you think own no land, livestock or any other productive assets?
b. What occupations do those who are poorly off have here?
c. What about the poorest?
d. What are the characteristics of families who are poorly off? (for example, in housing, illness, illiteracy, water supply, productive resources, household composition etc)
e. What are the priority needs of these families? What do they need to improve their conditions?
f. What are the main problems here faced by farmers who are poor?
g. About how many farmers here have difficulty meeting everyday needs? Is there a higher proportion in some hamlets than others? If yes, which ones?

Note: the above questions asking 'how many' and 'how much' were expected to be answered with approximations by the village head, precise answers were not necessary, answers given could be absolute numbers, percentages or fractions of the total number of households.

Rationale behind this part of the question schedule - The above questions were asked of key persons so that general background as to the location and activities of the village could be determined. This was essential knowledge for further questioning. Another purpose was so that this background information could be used to identify the status in the community of households to be interviewed. That is, their relative wealth and well-being could be determined thereby indicating to which socio-economic group they belonged.

II. Previous tree-planting experiences and tree usages by villagers

1. Is there any remnant forest in the village? (Of any type, eg: protection forest, conversion forest)
2a. Do local people use these forests for any purpose at the moment? If so how many families? Do they collect forest products or hunt for sale or private consumption? What products do they collect or hunt?
b. If they do not use them now, did they have traditional uses of these areas in the past? Did they collect forest products and/or hunt there for sale or private consumption? What products did they collect or hunt? How many families did so? Why are these traditional activities not carried out any more?

3a. Do people here grow trees on their private land? In their ladang? or in their housegardens? If not, why not?
b. If yes, what sorts of trees do they grow? Exactly whereabouts? and in what quantity?
c. Why do they prefer to grow these types of trees?
d. Are there any local trees that people know about but which they do not plant? Why don't they plant these kinds of trees?
e. Are there any local trees that people have mentioned to you that they would like to plant but they cannot do so? What are these trees? And why have they had problems nurturing them? (technical reasons, structural barriers eg: ownership of that tree type vests in the government)
f. What do people do with any products they extract from trees growing on their land? (home consumption? sale?) If they sell their products at which market and how do they get them there?
[Following questions relate to land and tree tenure]
g. Are there any types of trees which farmers are prohibited to use or cut regardless of whether they plant those trees or if they grow naturally? If so what types of trees are these?
h. Are farmers prohibited to plant trees on their own land? Are they prohibited from planting particular types of trees? If so what types are they prohibited from planting?
i. If a farmer does not own the land which he is cultivating, is he permitted to plant any type of tree on it? If yes, what type of trees? and later if the land returns to the owner who possesses the trees? If no, why not?

4a. Is there any communal land in the village?
b. If there is who has a right to use it?
c. What activities may occur on the communal land?
d. Can trees be planted on the communal land? If no, why not? If yes, what kinds of trees can be planted? (Are there specific species or not?)
e. If trees were planted on communal land would everyone have a right to use those trees and their products? Or would some groups have more of a right than others?
f. Have attempts ever been made to plant trees on the communal land? How did these go?

5a. Has the village ever been part of a government scheme to plant trees? (For example, Reboisasi, Reboisasi with ABRI supervision {AMR} or HTI) If yes, what type of scheme?
b. If no, was the village approached to participate but either it or the government chose against participation? If this was the case why did the village decide not to participate or why did the government decide not to proceed?
c. If yes, for how long did the project run? Is it still running? (cross check with information from Kehutanan)
d. If it has already finished how successful was the project? Are the trees still standing? How many people participated? From what socio-economic background were these people? Was participation mandatory or did farmers do so voluntarily? What did they receive in return for participation?
e. What were the people's feelings about the project at the time? Did they consider it a useful activity? Did they think it useful but that they had more important things to do?

6a. Have villagers in this village ever been approached to participate in a tree-planting project organised by a non-government organisation?
b. If yes, did the village follow this offer or decline to do so?
c. If the village declined what were the reasons for this?

d. If the village decided to proceed with the activity, farmers from which backgrounds participated and which chose not to do so?
e. What did the activity involve planting and whereabouts? What were people given in return for participation?
f. Was this tree-planting activity a success? Are the trees still standing? How many people participated?

Rationale behind this part of the question schedule - The above questions gathered information from a key person's perspective on existing and past tree-planting and tree usage activities in villages not engaging the NGO tree-planting activity. Questions investigated why they were not participating in this activity, whether it was a matter of not having a desire for tree products, their need for these products already being adequately met by existing activities, previous bad experience with tree-planting in either government or non-government programmes or behavioural or structural barriers in the village environment. The questions generated a qualitative concept of why these villages were not following.

b) Question Schedule for Village leaders and other key informants in villages which ARE engaging in YTN activities;

I. About the Village
This part of the schedule contained thirteen questions identical to those developed for village leaders that were not engaging in YTN activities. These are shown above in 3.a) Part I.

II. The NGO tree planting activity in the village
1. Has the local NGO, Yayasan Tananua, (in the case of E.Sumba) or any other NGO, come and encouraged tree-planting in this village? If yes, proceed. If no, this is in fact a non-engaging village, verify and change schedule.
2. When did the NGO commence its tree-planting activity in this village?
3a. What sorts of tree-planting activities is the NGO encouraging people to participate in?
b. What type of trees are being planted? What species? Are these trees local to the village or introduced? Local to E.Sumba or introduced?
c. What sort of land are these trees planted on? (Private, communal or government) If private land, whereabouts and on what type of private land? (eg: housegarden, ladang or elsewhere)
d. In what configuration are these trees being planted? In rows, around the border as fences, singularly, in blocks, mixed with crops, etc?
e. About how many trees are given to each household to plant?
f. Who owns the trees once they are planted? (the farmer, the NGO or the village)
g. Who has rights to cut and use the trees planted under this programme (the farmer only, the NGO, other villagers)
4. How many households are now taking part in this activity? Is this an increase in comparison to previous years of operation of the activity, or a decrease?
5. Did the households which are taking part in the NGO tree-planting activity volunteer to do so, or did they have to take part, or what? That is, how were they selected to take part?
6a. When the NGO initially came to the village with its proposal to conduct a tree-planting programme here how did it notify people so that they could get involved? For example, was there a public meeting?
b. If there was a public meeting what was the general reaction of farmers to the proposal at that meeting?
c. Were there people at this meeting who would have liked to have got involved but could not because of the form of the proposal? (eg: needed land to plant on) Why couldn't they get involved? Or was the proposal flexible enough to cater for all farmer situations?
d. Have any farmers mentioned to you reasons why they do not want to get involved in the project? If so, what were these reasons?
7a. Of the households taking part in the tree-planting programme, what has been their attitude and feelings about it? Have they made any comments to you in which they have expressed problems with the project as it stands? (Ways in which it could be improved) Or have they made any positive remarks about the programme? If so, what were these?

b. Can you give me the names and locations of households which are following the activity so that I may further discuss with them their experiences under this tree-planting activity?
8a. What are your feelings about the NGO project?
b. Why do you think some people have chosen to follow the project and others have not? What do you think are the main differences between the two groups?
c. Do you think the NGO project sufficiently helps in meeting the needs of your people? Do you think there are some groups that will benefit more than others or that all will get some benefit?
d. How do you think the NGO tree-planting project could be improved?

Rationale behind the above question schedule - The questions above verified information on the operation of the NGO tree-planting activity from the perspective of local leaders. They also gathered information on the nature of those groups engaging tree-planting and those who were not, so that any consistencies or differences could be detected. Finally the questions gathered information as to people's feelings and attitudes to the tree-planting, either from participants or non-participants.

III. Previous tree-planting experiences and tree usages by villagers
This part of the schedule contained five questions identical to those developed for village leaders that were not engaging in YTN activities. These are shown above in 3.a) Part II.

Question six varied slightly and is shown below;
6a. Have villagers ever been approached to participate in tree-planting by any NGO other than the one currently operating in this village? If no, end question schedule here.
b. If yes, did the village follow this offer or decline to do so?
c. If the village declined what were the reasons for this?
d. If the village decided to proceed with the activity, what did it involve planting and whereabouts? What were people given in return for participation? How many people participated?
e. Was this tree-planting activity a success? Are the trees still standing?

4. Question Schedules for qualitative, semi-structured household interviews.

a) Question schedule for households in villages which ARE NOT engaging YTN activities;

Introduction and explanation to the household

Before each interview the research aims were introduced. In villages not engaging YTN activities the introduction took the following form;
First, made personal introductions and revealed the researcher's institution and relationship with local organisations;
Then stated that the purpose of this research was to;
1. Uncover farmers' existing tree usages in housegarden, ladang and forest.
2. Listen to farmers tree-planting experiences under government and NGO projects.
3. Get farmers to discuss their desires as to trees, what they want and also get them to describe their needs.
4. Observe the existing farming system, socio-economic and natural environment to see which trees are consistent with it (socio-economic environment includes markets for trees, availability of inputs).
Then use this information to;
:Identify tree-planting activities suited to different locations.
:Identify constraints which may prevent farmers planting trees.
:Evaluate the ability of various programmes, government and NGO to get farmers to plant trees, evaluate from past experience and likely future outcomes.
The householder was reassured and guaranteed before the interview that all information was confidential and would only be used to indicate the general feelings of people in this village. No particular household would be identified in the writing of any resulting report.

I. Visual Observation of the Household
Upon arriving at the interviewee's house assessments were made of material conditions apparent. Particular objects focussed upon included;

i. The House
What are the house walls made of?
(eg: 1 - second hand things, woven bamboo, palm or other leaves; 2 - bamboo and wood but not hardwood, low quality wood, lower portion brick or cement upper portion some type of leaf; 3 - hardwood, brick and wood, brick, cement and plaster)
What is the roof made of?
(eg: 1 - thatching such as grass or palm leaves of poor quality; 2 - thatching of good thick quality, locally made tiles, thatch tile combination, corrugated iron; 3 - tiles which are factory made, corrugated iron in good condition and which is painted)
What is the floor made of?
(eg: 1 - earth, bamboo; 2 - boards of poor quality or ill fitted, cement; 3 - good quality boards, cement with tiles fitted on top)
What are the windows like?
(eg: 1 - none, just gaps in bamboo, frames only; 2 - frames with some sort of cover which opens; 3 - glass)
What furniture is there?
(eg: 1 - none, just one to three items; 2 - four to ten items usually made of wood or bamboo; 3 - more than ten, six to ten but of good quality)
Are there any electrical appliances apparent?
(eg: televisions, air conditioners, radios, refrigerators, sewing machines, etc)
What are the interior decorations like?
(eg: 1 - calendars particularly ones from years past, government posters; 2 - small photographs, small carved articles; 3 - large carvings, trophies, enlarged family photographs, unique objects)

ii. Around the house
Are there any vehicles in the house's yard?
(eg: hand-drawn cart, bicycle, horse-drawn cart, motorbike, three wheeled motor vehicle, four wheeled motor vehicle)
Are there any livestock in the house's yard?
(eg: chickens, ducks, goats, pigs, tethered cattle, buffalo, horses, fish {in ponds})
Are there any productive implements in the house's yard?
(eg: farming impements such as ploughs, weaving implements that is looms; but be careful with these as they are frequently loaned to the farmer only or cooperatively owned)

iii. Geographic location of the house
Is the house connected to electricity? Is it connected to piped water?
What is the condition of the access to the house?
(eg: small pathway connecting it to a road, dirt track, graded dirt road, paved road, major road connecting regional centres)
What is the location of the house like in relation to; village head's office, village market, Kecamatan market and health centres?
What is the house's position in relation to other dwellings?
(eg: isolated and stands alone, amidst other dwellings, next to or near shops)
What is the surrounding topography like?
(eg: alluvial plain, swamp, undulating hills, upland plain, mountainous)
What is the soil type and what is the condition of the soil?
(eg: sloping - flat, deep - stony, well drained - water logged, sandy - clayey)

iv. Appearance of the householders
What is the physical appearance of the householders like?
(eg: thin or obese; any apparent illnesses, obvious ones in NTT include, goiter, stomach infections and illnesses with flu-like symptoms notably malaria)
What is the condition of the householders' clothing?

(eg: clean or dirty, old or new, in good repair or in need of repair, shoes or barefoot, uniform or not)
Do the householders have clothing accessories?
(eg: hair decorations {pins, bows}, sunglasses, jewellery, watches {working or not}, government badges)
Note: when examining the clothing and accessories of householders, what was observed could have depended on the day of the week and where the householders had just come from. Most people had good clothes for wearing to church for example and similarly most people wore less than their best when spending the day working in their fields. Therefore, assessments of clothing had to be placed in context and not over-emphasised.

Planned question schedule;
II. Tree usage and previous tree-planting experiences of the household
1a. Do you have any trees on your land? On which land, your fields (ladang) or housegarden?
b. If yes, what sorts of trees are on your land?
c. In what configuration are these trees? That is, are they scattered, in blocks or in linear formation?
d. Did these trees grow naturally or did you plant them? If planted by the farmer, proceed to question 2. If not, proceed to question 3.

2a. If you did plant these trees, why did you choose to plant this particular type? What uses do you have for them?
b. Do you sell any of their products? If so, whereabouts and to whom? How do you get the tree products there? How long does it take to get them there?
c. What has been your biggest problem in trying to raise these trees? What other problems have you encountered?
d. Are there any types of trees that you know of that you would like to plant but you cannot? (perhaps your attempts to plant them have failed or perhaps you are prohibited from planting or cutting this type of tree)
Proceed to question 4.

3a. Have you ever tried to plant trees on your land? If not, why not?
b. If yes, how did these attempts go? What was the biggest problem you encountered in trying to raise these trees? What other problems did you encounter?
c. Why are you not continuing this activity now?
Proceed to question 4.

4a. Are there any trees which farmers in this village may not use or cut regardless of whether they grow naturally or are planted by farmers?
b. Are farmers prohibited from planting particular types of trees? If so, what types of trees are these?
Proceed to question 5.

5a. Is there any forest in the village area?
b. Do you use this forest for any purpose?
c. What do you use this forest for? Do you collect forest products or hunt animals? If so, what products do you collect and what animals do you hunt? What do you do with these products and animals? (private consumption, sale)
d. If you do not use this forest, why not? (is it illegal, do they feel there is nothing of value from it)
e. If you no longer use this forest, did you ever use it in the past? or do you remember your parents or grandparents going there to collect goods?
f. If you can remember past uses of forest, what was it that was collected from the forest?
Proceed to question 6.

6a. Do you ever cook using wood? If so, what type of wood is the best for cooking?
b. Is wood what you prefer to cook with? Where do you collect this wood? Who collects it? How often do you collect it and how long does it take to collect?

c. Have you ever found it difficult to collect enough wood to cook with? About how many times has this eventuated?
d. If you run out of wood to cook with what do you use instead?
e. Do you ever purchase wood to cook with? How often and how much do you normally have to pay?
7a. Do you ever make anything out of wood? If so, what is the best type of wood for each particular article that you make?
b. Do you have enough timber for all of your construction needs? If so, where do you get this timber from? If not, why not?
c. Do you ever purchase timber and if so what is its usual purchase price?
d. Do you ever find it hard to get enough feed for your livestock? (only ask if the respondent has said that he does have cattle)
e. When you go to market, do you ever buy fruit? If so, what varieties do you buy?
Proceed to question 8.

8. Would you like to receive free tree seedlings either from the government's forestry department or some other organisation? If not, why not? If yes, proceed to question 9. If no, proceed to question 10.
(Note: When asking this question it was stressed that it was not being suggested that the researcher had plans to distribute tree seedlings nor that he know of any organisation that did have immediate plans to do so in this area. It was indicated that farmers' feelings to such a suggestion were sought so that organisations with the capacity to give seedlings could be told whether farmers in this area really wanted them and if they did, their preferred types.)

9a. If you would like to receive free tree seedlings which types (species) would you prefer and roughly how many of each type would you like?
b. Do you have any idea as to where on your land you would like to plant them?
c. What would you plan to use these trees for?
d. What times of the year (season) would you like to receive and plant tree seedlings?
e. What times of the year (season) do you have the most spare time to dig pits and plant trees?
f. What times of the year (season) do you have the least spare time for this activity?

10a. Have you ever been involved in a forestry department scheme to plant trees or have you heard of such a scheme operating in this village? (eg: reboisasi, HTI) If no, and they have never heard of one in their village proceed to question 11.
b. If you have been involved in such a scheme, why did you take part?
c. What were you required to do under the scheme?
d. What did you get in return for your participation?
e. What sort of land was planted? (communal, government, private)
f. What sorts of trees were planted? In what configuration were they planted?
g. Did this programme interfere with your farming activities? How so? Did this programme reduce the amount of land you had for planting? What other thoughts do you have about this programme?
h. Can you think of any ways in which this programme could have been improved?
Proceed to question 11.

11a. Have you ever been approached to participate in a tree-planting project organised by a non-government organisation?
If no, proceed to question 12.
b. Did you choose to participate or not? If not, why not?
c. If you did choose to participate, what did the activity involve planting and whereabouts?
d. Did you feel that this activity interfered with any of your farming activities? If you felt it did, how so?
e. Do you think that this tree-planting activity was a success? Are the trees still standing? About how many people from this area participated?
f. How could this activity have been improved?

12a. Is there any communal land in the village?

b. Can you use this land? Do you use this land? If you do what do you use it for?
c. What sort of activities can occur on the communal land?
d. Can trees be planted on this communal land? If no, why not? If yes, what sorts of trees can be planted?
e. If trees were planted on the communal land do you think that you would be able to use their products and cut them? Why or why not?
f. Have attempts ever been made to plant trees on the communal land? How did these go?
End question schedule.

Rationale behind this part of the question schedule; The above questions were intended for farmers from villagers not engaging the NGO tree-planting activity. It was designed to see whether they had any bad experiences with tree-planting which may make the introduction of such a strategy more difficult. It also intended to discover whether farmers had any particular tree product needs and what their tree product preferences were. This indicated the necessity of a tree-planting activity and what form it should take if it was determined that such a programme was appropriate. A major intention was to discover farmers planting preferences in terms of trees preferred, best time of the year for planting etc, so that if a programmme was instituted some idea of farmers' wants would be apparent. With regard to the conceptual methodology, if it was apparent from questioning these farmers that they needed tree products, desire them and would be prepared to plant them and socio-economically were farmers in need, then questions had to be raised as to why the NGO was not operative in this area also.

III. About the household
1a. If the husband/wife is apparently absent ask; Where is your husband/wife? (will indicate marital status, whether a female headed household)
b. How many people live in this house?
c. Who are they?
2a. What do you work as? Do you have any other job, such as working for a local organisation, or helping the government?
b. What do other people who live here work as?
3a. Do you have any children? How old are they?
b. Where do they live, if not here?
c. Do your children go to school? If so, whereabouts and what year are they in?
d. Do any of your children work outside the home? Whereabouts do they work and what do they work as?

4a. Where are your fields? How far is that from here?
b. What crops do you grow in your fields?
c. What crops do you grow in your housegarden?
d. What do you do with the crops that you grow? (own consumption or sale)
e. If you sell your crops, where do you sell them? If at a market, how far is that market from here and how do you get there? How long does that take?
5a. Do you own the land where your fields are? Could you sell that land if you wanted to, or give it to someone else?
b. Do you own this house and the land which it is on or rent it from someone else?
c. Do you own land anywhere else, either in or outside this village?

6a. Do you own any livestock? If so, what sort? How many head?
b. What do you do with these livestock?
c. If you sell them, whereabouts do you do this? How far is that place from here? How do you get your livestock there?
d. What do you feed your livestock? Whereabouts do you get this food? Where do you keep your livestock at night?
e. From where do your livestock get water to drink?

7a. What is your staple food? That is, what food do you normally eat the most of on a regular, daily, basis?
b. What other foods do you frequently eat?

c. From where do you get this food? (grow it yourself, purchase)
d. Are there times of the year when the household does not have enough food to eat? When are these times? Why do they eventuate?
e. What fuel do you use to cook with? From where do you get this? How much would you use a day? (question for major household female)
8a. Where do you get drinking (cooking) water from in the dry season?
b. If the water is not piped or from a nearby well, how far is it from here to that water source? How long does it take you to go there and return with water? How many times do you collect water a day? Who collects this water?
c. Do you have enough water in the dry season?

9a. What illnesses has anyone in your family suffered in the last year? What other major illnesses have afflicted your family?
b. If anyone in your family has been ill, what did you do about it? Did you visit a health clinic, doctor or nurse? Did you purchase any medicine from an apotik? Did you make your own medicine? If you made your own medicine what did you make this from?

10a. In your farming what are the greatest problems you face?
b. What do you need to overcome these problems?
c. What are your and your family's other greatest needs? That is, what do you need to make your life easier here?

Rationale behind this part of the question schedule; To gather background information regarding villagers' way of life. To collect data allowing the characterisation of the household into a particular socio-economic group so that their thoughts about tree-planting can be allocated to a particular group.

Modifications made to the planned question schedule above;
Questions on tree-planting were asked before those on personal background as above but altered from the original plan. This was because the introduction to farmers stated that the research was interested in trees and therefore, talking about trees immediately was less likely to confuse respondents. To say the research was interested in trees but then start talking about the farmer's household was confusing. Furthermore questions on tree usage and planting appeared less sensitive and thus easier to ask. Having talked for a while it was easier to get onto more personal questions after familiarity had been established and farmers could see that the researchers were harmless.

With regard to part III, question 6 on livestock possession of the household, Sumbanese were coy about their possession of large livestock in particular (cattle, buffaloes and horses) and suspicious of anybody asking after them. We consequently asked;
What livestock illnesses frequently arise here?
What illnesses have your chickens or pigs been afflicted with recently?
What illnesses have your own large livestock been afflicted with recently?
This invited Sumbanese to tell us whether they had any livestock and about them but the initial reference to illness generated less suspicion.

Additional questions regarding influences on farmer households;
Have you ever been visited by an agricultural extension officer at your house or in your fields? If so, about how many times?
Have you ever been visited by an NGO extension officer at your home or in your fields? If so, about how many times?
Have you ever attended any extension or classes at the house of the RT, RW or Desa? If so, what classes? whereabouts? how often?

With regard to farmers' tree usages, more detailed questions were made into their use of pinang (Areca catechu) forest gardens. Including their work activities in these gardens (planting, maintenance and harvesting), the area of these gardens, how they were established and when and who possesses them and has a right to their use.

b) Question schedule for villages which ARE engaging YTN activities;

Introduction and explanation to the household
The exact introduction given to farmers in YTN activity villages evolved into this;
"My name is Justin Lee, I am from Australia and this is my wife Jeane from Kupang. We don't come from the government and don't come from any organisation such as Tananua. We come from a University, the University of Adelaide in Australia and here in Indonesia we work together with the Universitas Nusa Cendana at Kupang".
"We are conducting research here in Paberiwai, we are collecting information for the sake of knowledge. We are not here to give extension nor to tell you to do anything, nor to inspect anything. We are here to request your help in gathering information, we want to learn from your experience".
"This research we are conducting in six villages, Praimbana, Meorumba, Praibokul, Wanggameti, Katikuwai and Katikutana, for as long as one year".
"The topic of our research is not about farmers, its not about you, its about programmes. Programmes from government and NGOs which give out trees in the villages. These programmes include the subsidy desa programme which provides trees from BANGDES, and the programme of Tananua which gives out trees. Our research is outlining and describing these programmes. But so that we can understand the strengths and weaknesses of these programmes we need to ask you because you are being serviced by the programme and thus know most about them. Thus, we request your help as someone knowledgeable about these programmes to share with us your experience".
"If there are trees which you have received which have survived and you are happy with and feel valuable or other activities from the programme which you are satisfied with perhaps you can describe to us these trees and activities and why you are happy with them, so that this experience we can use as a basis for expanding those activities which farmers are happy about. If there are trees or activities which you have tried but they didn't survive or you are not that satisfied with perhaps you can tell us about these so that we can think about ways of improving these activities. Or perhaps you chose not to get involved in these programmes that's no problem. But perhaps you can tell us why you chose not to involve yourself and activities which perhaps you would like to get involved in or consider important so that we can get some idea of future programmes that are preferred by farmers".
"The information gathered by us as well as being used for the sake of knowledge will be shared with both BANGDES and Tananua so that they can consider the experience of farmers and use it to build on the strengths of their programmes or alter those aspects farmers are not satisfied with so that they can become more consistent with the desires, needs and difficulties faced by farmers. Therefore, we are inviting you to take part in the evaluation of these programmes and future planning".
[We stopped at this point, allowing farmers to digest what had been said and asking whether they had any questions up to this point.]
[There was no doubt it was difficult for farmers to conceptualise both the topic of our research and what 'research' is, especially since we in most cases were the first people they had met who were carrying out this peculiar concept of 'research'. Thus we often used an analogy to make the concept or topic of research clearer.]
"It is the same as if we want to buy a second hand motorbike or horse. If we just look at the motorbike or the horse they look fine but we don't really know how they will perform under all conditions. Therefore, we need to ask the ex-owner of the motorbike or the horse how they will perorm because the ex-owner has had the most experience with them. He knows if they go up hills with speed, how they handle on rough roads and the like".
"It is the same with these tree-planting programmes we need to ask you as somebody who has used these trees and activities how good they are and what problems they have because you have the experience, we only know of their advantages in theory".
"We of course have to ask a little about you and about your life here, in the same way we have to know a little about the background of the motorbike or horse owner. We have to know whether he likes to use full throttle on the bike or flog the horse because his handling of the bike or horse will relate to its performance. But this information is only to give us a better idea of the strengths and weaknesses of these programmes".

[We then explained why we interviewed from house to house, this was necessary because in most cases when government or NGO people visit the village environment they do not go house to house but normally call group meetings where mostly males attend at the house of either the Kepala Desa, Kepala Dusun or RK and occasionally to the house of the RT.]
"We come house to house like this so that everybody gets an opportunity to speak freely. If we call a group meeting at most two or three village leaders only would probably speak and no doubt one woman at the most, if any show up at all. Everybody else would just nod their heads and agree, 'yama'. But we come to hear the specific successes and difficulties that individual farmers have experienced and it is not guaranteed that everybody has the same experience. Different trees are tried by different farmers and also different difficulties are experienced and farmers have different needs. Women have different work tasks and thus they too may have different thoughts about the value of trees. Thus so that we can get a range of opinion we need to enter a variety of houses although due to time and labour constraints we can't visit every house".
("However when we write up our research we don't say this particular house said this or that, we talk generally about the constraints and successes experienced by farmers in this village, Desa Wanggameti or Desa Katikuwai").
[We then again enquired whether farmers had any questions.]

Common questions and concerns of farmers.
(i) "Why have you come to our houses, a Tau Jawa Maramba (foreigner), when nobody else including from our own government has ever come to our houses? Why do you come? and they don't?"
Response; "We have the principle that if anything (any new technology or activity) which we want farmers to receive (adopt) will not be adopted or received by them if it is not consistent with their personal desires, situation and needs. Therefore, we must come and find out what these desires and needs are so that the best activities can come into the villages. Government staff perhaps have the belief that they can ask the Kepala Desa or other tokoh (leaders) who will know the needs and desires of all the people here. However, we believe that the only person who best knows your needs and desires is you and the Kepala Desa best knows his own desires and needs. Therefore, we ask every person individually so that they can describe their needs, desires and experiences because they know these best".
(ii) "Have you come to see who is lazy and who is hardworking and the lazy ones will be moved out?" (This was a particularly strong belief in Katikutana where all farmers were living under the threat of having to follow local transmigration and move to Kakaha). If farmers asked this question it indicated that they mistrusted our introduction. What more could we say except this; "As I said previously we are not from the government nor from any organisation we were not sent by anybody but came of our own initiative to carry out this research which helps us with our programme of education and helps you by making programmes more consistent with your desires, needs and experiences".
"If the Indonesian government wants to move you out that's the business of the Indonesian government and you, they don't send Australians to move Indonesian citizens or choose who to move, we have no right to do this. And if they do do get Australians to work with the Indonesian government they don't send young ones like me, you'll spot that sort of Australian if they come, they're normally about 40 or 50 wearing a safari suit, with balding hair and broad belly and they'll probably not be too far from their four wheel drive".
We spoke openly and perhaps a little roughly with farmers but in general this type of response put farmers at ease, although no doubt suspicions remained. We then said, "If you don't have any other questions I'll ask a few questions which we can discuss, and if I ask anything you can ask me back why I ask that, that's no problem so that everything is clear and you have no doubts, so that we have an even discussion".

Before commencing the interview we again reassured and guaranteed the householder that all of the information given was confidential and would only be used to indicate the general feelings of people in this village. No particular household would be identified in the writing of any resulting report.

I. Visual Observation of the Household

This part of the question schedule contained four questions identical to those asked of households that were in villages not following YTN's activity. These questions are shown above in 4.a) Part I.

Planned question schedule;
II. Involvement in and experience of the NGO tree-planting activity
1a. Have you heard of the NGO, Yayasan Tananua, and do you know that they are encouraging tree-planting on private land in this village? If yes, proceed to part b. If no, proceed to section III.
b. If you have heard of this organisation and its activities here, have you in the past or are you now, taking part in their tree-planting activities? If yes, proceed to question 3. If no, proceed to question 2.

2a. If you are not participating in this activity and never have done so, why not? Do you not want to get involved? Or are you unable to or prohibited from taking part?
b. Were you approached to take part? If so, by whom? (NGO representative, village representative, neighbour, etc)
c. Did you know what the tree-planting activity involved you doing? If so, can you describe this? (eg: type of trees to be planted, on what land, in what configuration, tree quantity, maintenance requirements, rights to use and cut)
d. How could this activity be improved so that you would be inclined to follow it also? (if it could be improved to achieve this)
e. Would planting different types of trees help to get you involved? If so, what sorts would you like to plant?
f. Would planting on different sorts of land, such as communal, help to get you involved? If so, what sorts of land?
g. What other changes would you like to see made? (eg: time of year that they would like to plant)
Proceed to section III.

3a. If you are participating, or have participated, in this tree-planting activity, what first brought the activity to your attention? That is, from where did you first find out about the activity?
b. Who first formally invited you to participate in the activity? (NGO representative, village representative, neighbour, friend)
c. Why did you choose to participate in this activity? What was the most influential factor in making you follow it? What were your other reasons?

4a. What does the tree-planting activity require you to do?
b. What sort of trees are you planting under the NGO tree-planting activity? Who decided that these trees were the best to plant? (yourself, the NGO said that they would be the best trees to plant, or a joint decision)
c. On which land are the trees planted? (private, communal) If private land, what type of private land? (housegarden, ladang)
d. In what configuration are these trees planted? (get the farmer to draw a sketch map of how the trees are arranged on his/her land)
e. Approximately how many trees are on your lands now? Will you plant any more in the future?

5a. Did you plant the trees alone or were you assisted? If you were assisted, who was it that helped you? Exactly what kind of help did they give? Did you help anyone else plant their trees?
b. What sort of maintenance do the trees require now? Do you do this maintenance by yourself or are you helped? Does anyone from the NGO come and check up on the progress of your trees? Do you find that you have enough time to maintain the trees?

6a. Are you allowed to cut the trees on your land freely? (that is, whenever you want) If not, who or what is prohibiting you?
b. What sorts of things can you use the trees for when you have cut them?

c. Have you tried to sell any of the products from your trees? Where do you sell their products? Have you had any problems when trying to sell them?
d. Are you entitled to keep all of the products from your trees or do you have to divide them up with somebody else?
e. Do you use wood to cook with? If so, from where do you get this wood? How often do you get wood from that source?
f. Where do you get construction timber from at the moment? Do you think that in the future this will be able to come from your own garden?

7a. Have you had any problems planting and maintaining the trees? What were these problems?
b. Have you had any problems harvesting or selling the products from your trees? What were these problems?
c. Have you had any other difficulties with the tree-planting programme?
d. Is there anything else that you would like the NGO to help you with now?
e. If the project was to start up in another area can you suggest any ways in which it could be improved?
Proceed to section IIa.

Rationale behind this part of the question schedule; To separate participant households from non-participant households in engaging villages. To ask non-participants why they chose to act in that manner. To ask participants their reasons for following the activity and to discover their experiences under the project. Experiences given helped determine the success of the project, possible constraints that it faced and areas where it could be improved.

IIa. Participant households everyday tree usage and previous tree-planting experiences
It was indicated to participant households in engaging villages that as a final task there were some questions regarding their day to day tree usages, including their traditional usages of trees and any previous tree planting experiences they may have had.
1a. Did you have any trees on your land before you took part in the NGO tree-planting activity?
b. If yes, what sorts of trees were these? And on what land specifically? (that is, housegarden, ladang)
c. In what configuration were these trees?
d. Did you plant these trees or were they naturally growing?
If planted by the farmer proceed to question 2. If not, proceed to question 3.

2a. If you did plant these trees, why did you choose to plant that particular type? What use do you have for that particular tree?
b. In the current tree planting activity are you planting these trees again? If so, whose idea was this? If not, why not?
c. Did you ever sell any of the products from these trees in the past? If so, where did you sell them? Did you ever experience any problems in trying to sell them?
Proceed to question 4.

3a. Had you ever tried to plant trees on your land before the current tree-planting programme? If not, why not?
Proceed to question 4.

4a. Are there trees which farmers in this village may not use or cut regardless of whether they grow naturally or are planted by farmers?
b. Are farmers prohibited from planting particular types of trees? If so, what types of trees are these?
Proceed to question 5.

5a. Is there any forest in the village area?
b. Do you use this forest for any purpose?
c. If yes, what do you use this forest for? Do you collect forest products or hunt animals? If so, what products do you collect and what animals do you hunt? What do you do with these products and animals?

d. Do you feel that the trees which you are currently planting will be able to supply you with all of the products that you get, or used to get, from the forest?
e. If you do not use this forest, why not?
f. Did you ever use this forest in the past? If so what did you use from the forest at this time?
Proceed to question 6.

6a. Have you ever been involved in a government forestry department scheme to plant trees? If no, proceed to question 7. If yes, proceed to part b.
b. If yes, why did you follow this scheme?
c. Did you feel that this scheme interfered with any of your farming activities? Why was this?
d. Were there any problems with this scheme from your point of view? What were these problems?
e. Do you think this scheme was a success? Why or why not?
Proceed to question 7.

7a. Have you ever taken part in any other NGO tree-planting activity? If yes, proceed to part b. If no, end question schedule.
b. What sort of involvement did you have? What did you have to do under this programme?
c. Do you think this programme was a success? Why or why not?
d. From your point of view, what problems were there with this activity?
End question schedule.

Rationale behind this part of the question schedule; Participant farmers were questioned about their previous tree-planting experience and tree usage. Previous planting experience and usage may have given an idea as to the reasons why these farmers took part in the current NGO programme when compared to the previous experiences of non-participant farmers.

III. Non-participant households tree usage and previous tree-planting experience
Finally, non-participants were asked about any current usages of trees they had and about their previous tree planting experiences.
This part of the question schedule first seven questions were identical to the first seven questions asked of households that were in villages not following YTN's activity. These questions are shown above in 4.a) Part II.

Questions 8 and 9 varied from the corresponding questions in 4.a) Part II and are shown below.
8a. Have you ever been involved in a forestry department scheme to plant trees or have you heard of such a scheme operating in this village? (eg: reboisasi, HTI) If no, and they have never heard of one in their village proceed to question 9.
b. If you have been involved in such a scheme, why did you take part?
c. What were you required to do under the scheme?
d. What did you get in return for your participation?
e. What sort of land was planted? (communal, government, private)
f. What sorts of trees were planted? In what configuration were they planted?
g. Did this programme interfere with your farming activities? How so? Did this programme reduce the amount of land you had for planting? What other thoughts do you have about this programme?
h. Can you think of any ways in which this programme could have been improved?
Proceed to question 9.

9a. Have you ever taken part in any other tree planting activity organised by a non-government organisation? If yes, proceed to part b. If no, end question schedule.
b. If yes, did you feel that this activity improved your living conditions here?
c. Did you feel that participation in this programme interfered with your farming activities?
d. Do you think that this programme was a success? Why or why not?
e. How could this activity have been improved?
End question schedule.

Rationale behind this part of the question schedule; The above questions were intended for non-participant farmers from villages which were engaging the NGO tree-planting activity. It was designed to see whether they had any bad experiences with tree-planting which may explain their reluctance to participate. It is also intended to discover whether farmers had any particular tree product needs and what their tree product preferences were. This would help in the design of future tree-planting programmes which were consistent with these needs and preferences and which were therefore more likely to be adopted.

IV. About the household
This part of the question schedule contained ten questions identical to those asked of households that were in villages not following YTN's activity. These questions are shown above in 4.a) Part III.

Modification of the above planned question schedule;

Having used the above planned question schedule for a number of interviews the schedule was modified to make it more succinct and relevant to important factors that had been recognised by farmers. The general question schedule in the YTN activity villages of Katikuwai, Katikutana and Wanggameti thus took the following form;

1. What trees have you ever received from the Subsidy Desa Programme?
Both recently and in the past?
How many of each tree type did you receive? Did these trees live or die? If they died what do you contribute this to?
Where did you collect these trees from?
How did you get news that the trees had arrived? or did you know the date that the trees would arrive?
When you received the trees did you receive any extension? If so, who gave this extension?
Have you ever attended an LKMD meeting to select goods from the subsidy desa funds?
If so, how did what was requested compare to that which was received? If they were not consistent what do you contribute this to?
Have you ever received any other goods (non-tree goods) from the subsidy desa programme?

2. Have you ever received any other goods from other government programmes eg: from the GORA or GEMPAR or other projects in recent times? (eg: ORHUM in Katikutana).

3. Have you ever received any trees from Yayasan Tananua, which trees have you received?
For each tree did you receive saplings or seed, how much or many seed or saplings did you receive for each species? In what year did you receive each species? Did these live or die? If they died what did you contribute this to?
For horticultural and timber trees, why did you want to receive and plant these trees?
What is the predominant terrace tree that you have?
What year did you receive this tree?
Why did you choose to plant this tree over others?
Who first told you about this tree? Had you observed it anywhere else before you heard this extension?
Where did you hear this extension? Was it at a village meeting or at your house? If at a village meeting did you have to attend? If at your house did you invite the YTN officer to come and give this extension?
Have you ever tried planting food crops between these terraces? Which food crops? If they haven't planted a particular species of food crop enquire why this is so?
For how many years (seasons) have you intercropped with this food crop? (If they have done so continually move to the pruning question, if not continue.)
If they have only cropped for a few years enquire;
Why are you no longer intercropping there? or why did you rest that garden?
What are you doing with the terraced garden at the moment? What do you plan to do with that garden in the future?

How extensive (are) is this garden? In how many locations did you plant? How many times have you been given tree legume seed? (or how many belak of corn or padi do you plant there.)
How tall are the tree legumes now? Have you ever pruned these tree legumes?
How many times per year do you find it necessary to prune these tree legumes? Do you find pruning a difficult task? Why is it difficult?
Have you observed any ill effects on food crops from the terrace trees? Have you observed yourself any particular advantages?
Have you ever taken any seed from your terrace trees or other trees to plant yourself or distribute to friends, neighbours or YTN?
Have you ever attended a quarterly meeting of YTN?
How often does the YTN extension officer come to your house? When he comes what does he talk about? What do you ask him?

4. If you have chosen not to plant trees from YTN why is this?
Has anybody from YTN ever come to your house or have you ever attended a meeting of YTN?

5. Which government personnel, from which departments have ever come to your house or garden? What do they talk about? Which government personnel have ever come to the house of the RT, RK or Desa to talk at a public meeting which you have attended what did they talk about?

6. In your opinion are YTN and the government the same or different? What are the similarities and what are their differences? If you don't plant terraces are the people from government angry at you or not?

7. Do you still work an ordinary ladang? That is a ladang garden which does not have terraces? If so what do you plant there? How extensive is this garden? In how many locations? How many belak of rice or corn do you plant there?
What are the major difficulties you experience in working your ladang, in terms of work difficulties and factors that reduce the size of your harvest?
Is the land here for ladang fertile or not?
How many years can you work ladang before you must move on?
If you want to move on or expand your garden is there still plenty of land here or is it in short supply?

8. Do you have any sawah? Is this irrigated or rainfed? How extensive is this sawah? How many belak of padi did you plant here?
What are the major difficulties you experience in making sawah, in terms of work difficulties and factors that reduce the size of your harvest? Do you have problems getting buffalo?

9. Do you have any large livestock? What difficulties do you have looking after livestock? Is there still plenty of livestock fodder here?

10. What trees do you grow yourself? Not from government or from NGOs but trees which you have traditionally grown or perhaps taken from friends.

11. Have you noticed any illnesses or sicknesses in your trees that may cause them to die? or reduce their ability to fruit? How many trees are affected in this manner?
Which trees are difficult to estabish in your opinion? Often die when they're young?

12. Have you ever purchased any trees, saplings or seeds from anywhere?

13. Which tree products from your trees do you usually sell?
How much of this product do you sell each year? Where do you sell this product? How do you transport it there?

14. What other products (non-tree products) do you sell at market? Do you sell rice or vegetables perhaps?

15. Which products from trees which grow themselves in the *baluka* (scrub) or forest do you usually sell? (Sometimes if respondent appears open?, Where do you sell these?, Each time you go to the forest about how much do you get?, What price do you get?)
Are there other products from the forest which you take but don't sell, for your own consumption?

16. Do you still feel you need to plant more trees or do you consider that you already have enough?
If you don't want to plant any more why is this?
If you do, what trees do you consider most important to plant?

17. Where do you get construction wood from at present?
Is it difficult to get construction wood from that source? Why?
Do you feel that you need to plant trees for this purpose?

18. Where do you get fuelwood from at present?
Is it difficult to get fuelwood from that source?
Do you feel that you need to plant trees for this purpose?
If you have planted gamal or kaliandra do you use them for fuelwood? Do you consider them as suitable fuelwoods, what are their advantages and disadvantages?

19. Have you ever taken part in a Reboisasi project?
If not and there was one which you could have followed why did you choose not to take part?
If you chose to participate what were you required to do under this project? How long did it take?
What did you get in return for your work?
Why did you choose to take part?
If you didn't take part would people be angry with you? or would there be no problem?
Did you feel fortunate or unfortunate to take part in this project?

20. Are you in the forest zone here or not?
If this is forest zone does this discourage you from planting trees here?
For how long have you known you are in forest zone here? Do you have to move or can you remain here?

Visual observation of the household proceeded as normal and other information about the household was asked more informally outside of the interview setting often by a female research assistant to the household female who was reluctant to speak out above her husband in the formal setting.

Appendix B: Itinerary of fieldwork activities

11/11/92 :Arrived Jakarta.

12/11/92 :Reported to LIPI and Markas Besar POLRI, Jakarta, obtaining required documents.

13/11/92 :Reported to SOSPOL, Jakarta.

14/11/92 :Collected required documents from SOSPOL, Jakarta.

15/11/92 :Arrived in Kupang from Jakarta, 5PM.

16/11/92 :Reported to Immigration, Kupang. Letter from UNDANA not accepted by Immigration.
:Reported to PUSLIT UNDANA to request revised version of letter.
:Reported to POLWIL, Kupang and received relevant document.

17/11/92 :Returned to Immigration, Kupang, with completed formula, passport photos and photocopies.
:Returned to UNDANA to check on progress of letter.
:Reported to SOSPOL, Kupang.

18/11/92 :Returned to SOSPOL, Kupang.
:Reported to Taxation Office, Kupang.

20/11/92 :Received revised letter from UNDANA for Immigration, Kupang.
:Returned to Immigration Kupang with revised letter from UNDANA, told to return 25/11/92 to collect relevant document.
:Returned to SOSPOL, Kupang and received relevant document.

23/11/92 :Requested maps of East Sumba from Pertanahan, Kupang, mapping section.
:Discussion with Ir Syamsu, Head of Agriculture Faculty, UNDANA.

24/11/92 :Collected maps from Pertanahan.
:Discussion with Secretary of BAPPEDA, Tingkat I, Kupang.

25/11/92 :Returned to Immigration Kupang. Relevant documents unavailable.
:Discussion with staff of Yayasan Tananua, Kupang branch.

26/11/92 :Reported to BAPPEDA, Kupang to collect letter of recommendation.
:Returned to Immigration Kupang. Relevant documents unavailable.

27/11/92 :Returned to Immigration Kupang. Relevant documents unavailable.

28/11/92 :Returned to Immigration Kupang, collected KIM/S permit.

1/12/92 :Arrived in Waingapu, Sumba Timur from Kupang.

2/12/92 :Reported to Police (INTEL), Waingapu.
:Discussion with Program Coordinator of Yayasan Tananua, head office, Sumba, Nelson Sinaga.

3/12/92 :Returned to Police (INTEL), Waingapu.
:Reported to SOSPOL, Tingkat II, Sumba Timur.
:Introduction to and discussion with staff from BAPPEDA Tingkat II, Sumba Timur.

4/12/92 :Returned to SOSPOL Waingapu and collected relevant documents.

5/12/92 :Discussion with and request of data from BAPPEDA, Sumba Timur.
:Discussion with Kepala Seksi, Proyek Usaha Gotong Royong, BANGDES.

7/12/92 :Collected data from BAPPEDA and held discussion with Ketua BAPPEDA.

8/12/92 :Discussions with staff from Agriculture Department, East Sumba, including; Staff of Agricultural Extension, Staff of Horticulture and Food Crops Section, Kepala Tata Usaha.

9/12/92 :Discussion with Kepala Dinas, Dinas Perkebunan (Horticulture).

10/12/92 :Discussion with Kepala Dinas, Dinas Kehutanan (Forestry).

11/12/92 :Discussion with Kepala Dinas, Dinas Sosial (Social).

12/12/92 :Collected evaluation sheet from BANGDES, further discussion with BANGDES staff, collected secondary data, Potensi Desa reports for Kec. Tabundung.

14/12/92 - 18/12/92 :Attended 5 day quarterly farmers meeting of Yayasan Tananua at Desa Karita, Kec. Tabundung.

19/12/92 - 20/12/92 :Writing up results of farmers meeting at Karita.

21/12/92 :Analysis of Potensi Desa reports Kec. Tabundung.

22/12/92 :Discussion with Kepala Kantor, BANGDES.
:Checked on progress of evaluation sheets at Dinas Perkebunan and Dinas Kehutanan.
:Discussion with Kepala Kantor, Kantor Statistik.

23/12/92 - 24/12/92 :Analysis of data borrowed from Kantor Statistik.

26/12/92 - 28/12/92 :Visit to Waikububak, West Sumba.

29/12/92 - 3/1/93 :Analysis of Potensi Desa reports for Kec. Paberiwai.

4/1/93 :Returned data to BANGDES.
:Collected evaluation sheets from Dinas Pertanian, Tanaman Pangan and BIMAS.
:Checked on progress of evaluation sheets at Dinas Perkebunan and Kehutanan.

5/1/93 :Interview with Program Coordinator of YTN, Sumba, Nelson Sinaga.

9/1/93 :Travelled from Waingapu to Kananggar, capital of Kec. Paberiwai.
:Reported to Kantor Kecamatan, discussion with Kecamatan staff and informally with Kepala Desa, Desa Kananggar.

10/1/93 - 14/1/93 :Discussions with residents of Kananggar and observations of village conditions.

15/1/93 :Discussion with Camat, Kec. Paberiwai.

16/1/93 - 18/1/93 :Discussions with residents of Kananggar and observations of village conditions.

19/1/93 :Discussion with Camat, Kec. Paberiwai, received letter of recommendation.

20/1/93 :Discussion with YTN extension officer, Desa Mehangmata.

21/1/93 - 23/1/93 :Travelled to Desa Praimbana.
:Introduction to and discussions with Kepala Desa Praimbana and Kantor Desa staff about village conditions and suitable time to return to talk to farmers.

25/1/93 - 27/1/93 :Travelled to Desa Praibokul.
:Introduction to and discussions with Kepala Desa Praibokul and Kantor Desa staff about village conditions and suitable time to return to talk to farmers.

28/1/93 :Travelled from Tana Rara, Praibokul to Kabupaten capital, Waingapu.

29/1/93 - 30/1/93 :Writing up results of discussions with Kepala Desa, village leaders and village residents.

31/1/93 - 3/2/93 :Preparation of quarterly progress report for LIPI and UNDANA, Kupang.

4/2/93 :Travelled from Waingapu to Kupang, provincial capital, NTT.

23/2/93 :Returned to Waingapu from Kupang.

24/2/93 :Contracted vivax malaria.

25/2/93 - 7/3/93 :Resting and recuperating in Waingapu.

8/3/93 :Meeting with programme coordinator, Yayasan Tananua, Waingapu.

9/3/93 :Travelled to Kananggar.

10/3/93 - 14/3/93 :In Kananggar.

15/3/93 :To Desa Meorumba.

16/3/93 - 17/3/93 :In Desa Meorumba, introduction to Kepala Desa and village leaders.

18/3/93 :Returned to Kananggar from Meorumba.

19/3/93 - 21/3/93 :Resting in Kananggar.

22/3/93 - 23/3/93 :To Desa Wanggameti, introduction to and discussion with Kepala Desa and village leaders.

24/3/93 - 25/3/93 :To Desa Katikuwai, introduction to and discussion with Kepala Desa, village leaders and farmer extensionist of YTN.

26/3/93 :To Desa Katikutana, introduction and discussion with Kepala Desa.

27/3/93 :Returned to Desa Kananggar.

28/3/93 - 31/3/93 :Resting in Kananggar.

1/4/93 :Travelled to Desa Praimbana.

2/4/93 - 4/4/93 :Meeting farmers at Dusun Tama Pajurung.

5/4/93 :Resting in LaAu.

6/4/93 :Attended village meeting of farmers at LaAu.

7/4/93 - 9/4/93 :Meeting farmers at Dusun Prokut.

10/4/93 - 11/4/93 :Meeting farmers at Dusun Kabundu Wayu.

12/4/93 :Meeting farmers at Dusun Tama Pajurung.

13/4/93 - 14/4/93 :Meeting farmers at RT Kalala.

15/4/93 :Attended opening of church meeting at Desa Praimbana.

16/4/93 :Returned to Kananggar from Praimbana.

17/4/93 :Travelled to Desa Praibokul.

18/4/93 :Planning in Tana Rara.

19/4/93 :Meeting farmers at RT Katoda.

20/4/93 :Meeting farmers at RT Lobung.

21/4/93 - 22/4/93 :Meeting farmers at RT Katoda Bunggur.

23/4/93 :Meeting farmers at RT Tama.

24/4/93 :Meeting farmers at RT Laiwinu.

25/4/93 :Resting in Tana Rara.

26/4/93 :Meeting farmers at RK Laiwinu.

27/4/93 - 28/4/93 :Meeting farmers at RK Kamboni and RT Tana Rara Timur.

29/4/93 :In Tana Rara.

30/4/93 :Returned to Kananggar from Desa Praibokul.

1/5/93 :Returned to Waingapu from Kananggar.

4/5/93 :Travelled to Kupang from Waingapu.

5/5/93 :Reported to Immigration, Kupang in order to extend visa.

8/5/93 :Received extension of 3 months to research visa from Immigration Kupang.

9/5/98 - 22/5/93 :Analysing data, writing second 3 month report and resting in Kupang.

23/5/93 :Returned to Waingapu, Sumba Timur.

26/5/93 :Returned to Kananggar, Kecamatan Paberiwai.

28/5/93 :Travelled to Desa Wanggameti in order to meet and interview YTN extension officer, Abbas.

29/5/93 :Returned to Kananggar.

1/6/93 :Travelled to Desa Meorumba.

2/6/93 :Resting and planning in Meorumba.

3/6/93 - 4/6/93 :Meeting farmers at RW Lakombu.

5/6/93 :Meeting farmers at RW Tanabara.

6/6/93 - 8/6/93 :Meeting farmers at RW Umajawa.

9/6/93 :Resting at house of Kepala Desa.

10/6/93 :Meeting farmers at RW Lakombu.

11/6/93 - 12/6/93 :Meeting farmers at RW Maukabunu.

13/6/93 :Resting at RW Umajawa.

14/6/93 :Returned to Kananggar from Meorumba.

15/6/93 - 16/6/93 :Resting in Kananggar.

17/6/93 :Travelled to Desa Wanggameti.

18/6/93 - 19/6/93 :Meeting farmers at RW Laironja.

20/6/93 :Travelled to RW Pahulubandil.

21/6/93 - 22/6/93 :Meeting farmers at RW Pahulubandil.

23/6/93 - 24/6/93 :Meeting farmers at RW Halawala.

25/6/93 :Attending wedding ceremony at RW Pahulubandil.

26/6/93 :Meeting farmers at RW Kapumbung.

27/6/93 :Resting in Laironja.

28/6/93 :Meeting farmers at RW Kapumbung.

29/6/93 - 30/6/93 :Resting in Laironja.

1/7/93 :Travelled to Desa Katikuwai.

2/7/93 :Planning activities in Katikuwai.

3/7/93 - 5/7/93 :Meeting farmers at RW Kalimbuwai.

6/7/93 :At house and garden of YTN extensionist at Kawatu.

7/7/93 :Meeting farmers at Kawatu.

8/7/93 - 9/7/93 :Meeting farmers at RW Matawaiwatu.

10/7/93 :Meeting farmers at RW Laingira.

11/7/93 :Resting at RW Laingira and travelled to Laru.

12/7/93 :Meeting farmers at RT Laru.

13/7/93 :Meeting farmers at RW Watubara.

14/7/93 :Meeting farmers at RW Watubara and RT Pahamburwai.

15/7/93 :Resting at house of YTN extensionist.

16/7/93 :Travelled to Desa Katikutana, meeting farmers at RT Laiwinu.

17/7/93 :Meeting farmers at RW Wairunu.

18/7/93 - 19/7/93 :Meeting farmers at RW Wairunu.

20/7/93 - 23/7/93 :Meeting farmers at RW Makahar, including RT Aipaaking, Tanapingi and Kahirik.

24/7/93 - 25/7/93 :Meeting farmers at RW LaAu.

26/7/93 :Meeting farmers at RW Handula.

27/7/93 - 29/7/93 :Meeting farmers at RW Pinduwatu.

30/7/93 :Travelled out of Desa Katikutana to Kananggar, via TanaRara.

31/7/93 :Returned to Waingapu from Kananggar.

1/8/93 - 2/8/93 :In Waingapu.

3/8/93 :Travelled to Kupang from Waingapu.

4/8/93 :Reported to immigration Kupang, receiving supervisor from University of Adelaide.

6/8/93 :Requested letter of sponsorship from UNDANA.

7/8/93 :Collected letter from UNDANA and presented it to immigration Kupang.

10/8/93 :Received extension of research visa from immigration Kupang.

13/8/93 :Discussion with Tonny Djogo to arrange presentation of research method and result at POLITANI.
Discussion with YTN secretary at Kupang, Patriz Da Gomes.

14/8/93 - 20/8/93 :Preparing research presentation for POLITANI and third 3 month report for LIPI.

19/8/93 :Discussion with head of Balai Penelitian Kehutanan, Kupang, Ir Sutarjo.

21/8/93 :POLITANI informal seminar cancelled.

24/8/93 :Returned to Waingapu from Kupang.

25/8/93 :Discussion with YTN program coordinator, Umbu Rada.

26/8/93 :Discussion with staff of BANGDES, Sumba Timur, Dundu Tay.

27/8/93 :Arranging to get new interpreter.

28/8/93 :Visit to Kambaniru, Waingapu.

31/8/93 :Returned to BANGDES, Sumba Timur.

4/9/93 :Returned to Kananggar from Waingapu.

6/9/93 :Discussion with Wakil Camat, Kecamatan Paberiwai regarding the OPSUS and GEMPAR programmes.

8/9/93 :Travelled to Laironja, Desa Wanggameti

9/9/93 - 27/9/93 :Residing in Desa Wanggameti undertaking participant observation and qualtitative interviewing of farmers with emphasis on farmer labour availability, women's thoughts as regards their role and position, and forest utilisation.

28/9/93 - 1/10/93 :In RK Pinduwatu, Desa Katikutana to attend three monthly YTN farmers meeting for the purposes of observing the nature of the meeting and providing farmers and YTN staff with an opportunity to here and challenge some of the research's preliminary results.

2/10/93 :Travelled to Desa Ramuk via Desa Katikuwai.

2/10/93 - 8/10/93 :In Desa Ramuk conducting semi-structured interviews with village leaders and key persons, informal interviews with select farmers and observing the adoption of YTN technologies and the utilisation of forest zones for shifting cultivation.

9/10/93 :Travelled to the coastal area of Desa Lailunggi, Kecamatan Tabundung.

9/10/93 - 10/10/93 :In Desa Lailunggi meeting ex-YTN staff members and discussing reasons why YTN activities in that village had ceased.

11/10/93 :Returned to Kananggar

13/10/93 :Returned briefly to Desa Wanggameti to collect plant specimens.

14/10/93 :Final discussions with the Camat of Kecamatan Paberiwai at Kananggar as regards preliminary research results.

15/10/93 :Returned to Waingapu from Kananggar

16/10/93 :Meetings with Forestry Department volunteer staff regarding reforestation project details and with staff from Agricultural extension regarding preliminary research results.

18/10/93 :Meetings with Head of BAPPEDA at the regency level in Waingapu and with the head of PHPA (conservation officers) at Waingapu.

19/10/93 :Visit to LITBANG (forestry department) research station at Waingapu.

23/10/93 :Returned to Kupang from Waingapu.

25/10/93 :Meeting with Leo Banilodu staff at the Universitas Katolik Kupang for assistance in species identification and with Dr Graham Harrington (conservation programme in Sumba) to discuss conditions in East Sumba.

28/10/93 :Further meeting with Leo Banilodu.

29/10/93 - 10/11/93 :Final visits to the Research Centre of the Universitas Nusa Cendana, to Ir Tonny Djogo at the Agricultural Polytechnic to discuss preliminary reseach results and to the Immigration Department.

11/11/93 :Returned to Australia.

Appendix C: Problem of female staff leaving YTN because of marriage/pregnancy

As indicated in Chapter Five, in WN/YTN reports, YTN's problem retaining female staff members is attributed to either their desire to marry or their pregnancy and wish to bear children. It is felt however, that this dismisses the problem and does not reveal its full complexity. It also possibly misrepresents the situation by implying that the decision to cease working as extensionists is made entirely freely by the women involved.

Two current female staff members told a different version of the situation, in confidence, to a female research assistant (originating from NTT) during the period of data collection. This story is relayed in this format due to the confidential manner in which this information was acquired, the informants' continued employment with YTN, the YTN hierarchy's dislike for and disagreement with this version, and the informants' unwillingness to stand by their version of events in public meetings. Nevertheless, despite its sensitivity it is important to convey because it moves beyond rhetoric to give a fuller picture of the actual treatment of women by the YTN hierarchy and supports the notion that a degree of male bias exists in the organisation.

The alternative version of events, provided by these informants, asserts that four young females aged between 18 and 25 years and educated to senior high school level left the organisation because they became pregnant outside of marriage. If they were to stay with the organisation the programme coordinator demanded to know the identity of their partner and they had to organise marriage. If they refused to comply, as all in this situation chose to do, they were fired. Only one female left YTN freely because she genuinely wanted to get married. The last female staff member to be fired for this reason did not receive an extra months wages from YTN as is normal for those whose employment is terminated. Her baby died while very young and she now wishes to rejoin the organisation. The YTN hierarchy argued that these women could not stay with the organisation as single mothers because that would reflect unfavourably on YTN's reputation. At the time of data collection there remained just three females in the organisation from a total of about twenty Sumba based staff. These females said that they feared for their future in the organisation and indicated that they must be very conscious of what they say and do or else they expect that they too will be expelled.

This treatment reflects the YTN hierarchy's insensitivity towards those females constituting its own staff and illustrates that protection of the programme and organisation is more important than the welfare of individual women. Similarly, personal concerns expressed by the informants illustrate the degree of insecurity that women feel in relation to their positions within the agency. It can be argued that YTN should have been more sensitive to the situations of the women involved, and demonstrated greater flexibility, because the organisation was to a degree responsible for the problem. YTN's responsibility arose from the fact that it took young women away from their families and placed them in alien environments where they often had no family at all. It continues to be policy that extension officers be moved away from their villages of origin. This policy has many advantages from an extension viewpoint, however, this dilemma illustrates its failings. The effect of being taken away from family is far more significant in traditional Sumbanese society than it is in modern societies.

YTN's insensitive and inflexible management of this situation indicates a degree of male bias in the organisation. This bias is further demonstrated if one looks at the hypocrisy surrounding the argument used by YTN to justify its actions. It was argued by the hierarchy that to allow single mothers to continue as staff members would damage YTN's reputation. However, YTN's male staff members are allowed to have two or more wives, as the supervisor at the time of data collection had. In Indonesia people of Christian faith are prohibited from following polygamy and the relevant supervisor is Christian. This type of relationship, it could be argued, may thus damage YTN's reputation amongst Indonesian Christians especially the strongly religious residents of the provincial capital at Kupang. Perhaps the YTN hierarchy is not

concerned with what outsiders think and is only worried if their reputation is ruined amongst potential recipients in Sumba. However, the polygamous supervisor mentioned above, has also offended local Sumbanese by demonstrating in public, at the Pinduwatu quarterly meeting, a degree of intimacy with an eighteen year old female YTN cadre. A relationship between a forty year old married man and an eighteen year old woman is not offensive to the Sumbanese nor is their marriage for her to become his third wife. What did offend older Pinduwatu residents was the intimacy demonstrated by the couple before they were either formally married or a brideprice paid. By western (and perhaps urban Indonesian) standards, this intimacy was timid, merely involving the couple arriving at and departing from the meeting on the same motorcycle, having private discussions while the meeting proceeded, and sleeping in the same hut. However, this was beyond what is permitted by Sumbanese tradition. Therefore, the male bias of YTN can be seen in the manner in which males may engage in modern relationships without retribution while females are prohibited from doing the same.

At a meeting between the staff of YTN and the researcher in October 1994, almost one year after the period of data collection finished, YTN's hierarchy disagreed with the problem of female staff members as reported above. While not denying that the females in question became pregnant outside of marriage and left the organisation, the programme coordinator said that after long discussions they themselves did not wish to continue working for YTN. He said that they were free to continue working if they wanted to but none chose to take up this option. They were not fired but honourably resigned.

Obviously these two versions of events are incompatible. If the coordinator's statement is true then this acts to revoke what has been stated above regarding the position of women in the organisation. The two female informants providing the alternative version also attended the October meeting. However, they did not dispute what was said by the coordinator. Does this mean that their initial claims were false? One cannot be certain. Considering the feelings of fear that they expressed in their initial interview it would be very surprising if they could generate enough courage to challenge the testimony of the programme coordinator at a public meeting attended by more than twenty staff members. The motivations of the respective parties must be considered when assessing the truth of their statements. For the female informants there would be no advantage in contriving a story of this type, considering the insecurity they already felt regarding their employment. Even believing them to be true, to express their version of events must have required much confidence in the research assistant and concern for the condition of women in the agency. On the other hand the truth of the informants' testimony would not enhance YTN's reputation.

Nevertheless, the truth cannot be clearly ascertained and it is possible that the informants were mistaken as to their interpretation of events, for this reason it is probably better that this version is contained in an appendix. Two firm conclusions can be derived from this situation regardless. First, there is some female dissatisfaction with their treatment as staff members. Second, because the informants were not confident to reaffirm and stand by their testimonies at the October meeting, it is evident that these YTN group meetings are not entirely participatory, especially when contentious issues are discussed.

Appendix D: Forest products extracted by farmers in the study villages

Various types of forest products extracted from the high altitude Wanggameti forest and the mid-altitude forests of Meorumba and Praimbana villages

Indonesian or Sumbanese (Mahu version) name	Scientific name[1]	Location found[2]
Products sought for the express purpose of sale		
Gaharu	Aquilaria malaccensis	ALL
Loba	Peltophorum pterocarpum	WGM
Kayu manis	Cinnamomum zeylanicum	WGM
Cendana	Santalum album	MEO, PMB
Kayu kuning (Iju)	(?)	MEO, PMB
Products sought for sale or personal use		
Sirih hutan	(?)	ALL
Rattan	Calamus caesius	ALL
Hamui	Neolitsea sp.	WGM
Kayu putih	Melaluca leucadendron	WGM
Genoak	(?)	WGM
Alia	Zingiber officinale	WGM
Kunyit	Curcuma domestica	WGM
Melinjo	Gnetum gnemon	MEO, PMB
Products sought primarily for eating (not for sale)		
Sayur paku	(?)	ALL
Kainjilo	Ficus variegata	WGM
Murungiha (chewing only)	(?)	WGM
Tada Kurang (chewing only)	(?)	WGM
Ri runjat	(?)	MEO, PMB
Ri moji	(?)	MEO, PMB
Iwi	Dioscorea hispida	MEO, PMB [3]
Tanggala	(?)	MEO, PMB
Products used for medicinal purposes[4]		
Kawas	(?)	WGM
Murung menandang	(?)	WGM
Katamba malara	(?)	WGM
Kalihi	Ficus pilosa	WGM
Watu kamambi	Ervatamia macrocarpa	WGM
Kolang	(?)	WGM
Karouka	(?)	WGM
Papa	Acrostichum	WGM
Alak	Uvaria (?)	WGM
Kanando kiking	(?)	WGM
Rakan	(?)	WGM
Kaiyarak	Quercus priformis	WGM
Products used for tying and binding		
Nggai	Flagellaria indica or Timonius timon (?)	ALL
Panetang	Anamirta cocculus	WGM
Lulumulung	(?)	WGM
Kambu lawara	Indigofera (?)	WGM
Maninuwai	(?)	WGM

Trees used in house construction		
Kanunuk or Kanunu	Drypetes ovalis	ALL
Cemara hutan	Podocarpus imbricatus	WGM
Metiwundung	(?)	WGM
Kiru bara	Dysoxylum parasiticum or cavlostachyum	WGM
Kiru mata manu	As above	WGM
Tambula	Glochidion (?)	WGM
Wihi kalauki	Calophyllum soulattri	WGM
Kawita kaba	Linociera	WGM
Kayu lombok	(?)	WGM
Laru	Knema cinerea or Garcinia (?)	WGM
Kaduru	Palaquium obovatum or Eryptocarya (?)	WGM
Lobung	Decaspermum or Syzgium (lineatum)	WGM
Mayela	Orophea polycarpa or Artocarpus glaucus	MEO, PMB
Manera	Aglaia eusideroxylon	MEO, PMB
Linu	Glycosmis or Grewia eriocarpa (?)	MEO, PMB
Kanawa	Pterocarpus indicus	MEO, PMB
Kapehu	(?)	MEO, PMB
Langgapa	(?)	MEO, PMB
Kapali	Ixora (?)	MEO, PMB

Notes:
1. Reliability of scientific names is not great, most taken from Verheijen (1990).
2. WGM = known to come from the high altitude (1000+ metres) forest of Wanggameti.
   MEO, PMB = known to come from those forests of Meorumba and Praimbana village which are elevated to about 500 metres above sea level.
   ALL = known to come from both of the above forest types.
3. Iwi or forest yams are actually found in the Wanggameti area but not in the Wanggameti forest itself. Preferring degraded or secondary forest, it occurs in such sites in Wanggameti village in low lying areas.
4. Particular uses of medicinal plants was also obtained.

BIBLIOGRAPHY

Adams M.J., 1980, "Structural Aspects of East Sumbanese Art", in Fox J.J. (ed), 1980, **op cit**, 208-220.

Agarwal B., 1986, **Cold Hearths and Barren Slopes: The Woodfuel Crisis in the Third World**, Zed Books, London.

Ahmad A.M., 1990, "Agroforestry - Its Role and Impact in Southeast Asia" in SEAMEO BIOTROP, 1990, **op cit**, 9-28.

Ahmad A.M. and Abood F., 1990, "Selected Forest Trees with Potential Application in Malaysian Agroforestry" in SEAMEO BIOTROP, 1990, **op cit**, 77-89.

Ahmed I. and Ruttan V.W. (eds), 1988, **Generation and Diffusion of Agricultural Innovations: the role of institutional factors**, Gower, Aldershot.

Allen B.J., 1993, "The Problems of Upland Land Management", in Brookfield H. and Byron Y. (eds), 1993, **op cit**, 225-237.

Amacher G.S., Hyde W.F. and Rafiq M., 1993, "Local Adoption of New Forestry Technologies: An Example from Pakistan's Northwest Frontier Province" in **World Development**, V 21 (3), 445-453.

Anderson A.B. (ed), 1990, **Alternatives To Deforestation: Steps toward sustainable use of the Amazonian Rainforest**, Columbia University Press, New York.

Andrews K., 1992, "An NGO Perspective" in **Development Bulletin**, April 1992, V 23, 22-24.

Arnold J.E.M., 1984, "Forestation for Local Community Development" in Wiersum K.F. (ed), 1984, **op cit**, 48-62.

Aweto A.O. and Obe O.A., 1993, "Comparative Effects of a Tree Crop (Cocoa) and Shifting Cultivation on a Forest Soil in Nigeria" in **The Environmentalist**, 1993, V 13 (3), 183-187.

Ayre-Smith R., 1991, "Livestock Development in NTT", in Barlow C., Bellis A. and Andrews K. (eds), 1991, **op cit**, 85-104.

Bali Post, Daily newspaper of the province of Bali, Indonesia, 4th October 1994.

BANGDES, 1992, **Laporan Potensi Desa**, Reports on village potentials for villages of Paberiwai and Tabundung districts, Kantor Pembangunan Desa, Waingapu, Sumba Timur.

BANGDES and UNDANA, 1986, **Identifikasi Penduduk and Calon Lokasi Penataan Desa di Kabupaten Dati II TTS and Kabupaten Dati II Sumba Timur**, Kerja sama antara Dirjen BANGDES Depdagri dengan Universitas Nusa Cendana, Kupang.

Banilodu L. and Saka N.T., 1993, **Analisis Deskriptif Hutan Pulau Sumba**, Hasil Penelitian Ekspedisi Sumba 1992, Disponsori oleh International Council for Bird Preservation (ICBP), Universitas Katolik Widya Mandira, Kupang.

BAPPEDA, 1986, **Profil Investasi Kabupaten Daerah Tingkat II, Sumba Timur**, Pemda Tk I NTT, Badan Perencanaan Pembangunan Daerah, Nomor Bap OH 2/462.

BAPPEDA and Lynch S., 1988, **NTTIADP, Phase 3 Identification, Sumba Timur, Report and Project Proposal**, Nusa Tenggara Timur Integrated Area Development Project, kerja sama antara Badan Perencanaan Pembangunan Daerah, NTT, Kupang and ACIL Australia Ltd for Australian International Development Assistance Bureau.

Barlow C., 1991, "Conclusions and Recommendations", of Barlow C., Bellis A. and Andrews K. (eds), 1991, **op cit**, 231-240.

Barlow C. and Bellis A., 1991, "Introduction", to Barlow C., Bellis A. and Andrews K. (eds), 1991, **op cit**, 1-6.

Barlow C., Bellis A. and Andrews K. (eds), 1991, **Nusa Tenggara Timur: The Challenges of Development**, Department of Political and Social Change, Research School of Pacific Studies, The Australian National University.

Barlow C. and Gondowarsito R., 1991, "Socio-economic Features and Potentials", in Barlow C., Bellis A. and Andrews K. (eds), 1991, **op cit**, 15-30.

Basu N.G., 1984, "Community Forestry and the Local Community" in Wiersum K.F. (ed), 1984, **op cit**, 193-204.

Bebbington A. and Farrington J., 1993, "Governments, NGOs and Agricultural Development: Perspectives on Changing Inter-Organisational Relationships" in **The Journal of Development Studies**, V 29 (2), 199-219.

Beer de J.H. and McDermott M.J., 1989, **The Economic Value of Non-Timber Forest Products in Southeast Asia: with emphasis on Indonesia, Malaysia and Thailand**, Netherlands Committee for IUCN, Amsterdam.

BKKKS and OXFAM, 1992, **Lembaga Swadaya Masyarakat/Lembaga Pengembangan Swadaya Masyarakat di Nusa Tenggara Timur**, Terbitan Kerjasama Badan Koordinasi Kegiatan Kesejahteraan Sosial Propinsi Nusa Tenggara Timur dengan OXFAM Indonesia.

Blair H.W. and Olpadwala P.D., 1988, **Forestry in Development Planning: Lessons from the Rural Experience**, Westview Press, Boulder and London.

Boeky G., 1991, "Regional Policy in NTT", in Barlow C., Bellis A. and Andrews K. (eds), 1991, **op cit**, 63-72.

Booth A., 1991, "Regional Aspects of Indonesian Agricultural Growth", in Hardjono J. (ed), 1991b, **op cit**, 36-60.

Brett E.A., 1993, "Voluntary Agencies as Development Organizations: Theorizing the Problem of Efficiency and Accountability" in **Development and Change**, V 24 (2), 269-303.

Brodhead T., 1987, "NGOs: In One Year, Out the Other?" in **World Development**, V 15 Supplement, 1-6.

Brookfield H. and Byron Y. (eds.), 1993, **South-East Asia's Environmental Future: The Search for Sustainability**, United Nations University Press and Oxford University Press.

Brookfield H., 1993, "Conclusions and Recommendations", in Brookfield H. and Byron Y. (eds), **op cit**, 363-373.

Brookfield H. and Padoch C., 1994, "Appreciating Agrodiversity: A look at the Dynamism and Diversity of Indigenous Farming Practices", in **Environment**, V 36 (5), 6-11, 37-45.

Bruce J.W. and Fortmann L., 1988, "Why Land Tenure and Tree Tenure Matter: Some Fuel for Thought" in Fortmann L. and Bruce J.W. (eds), 1988, **op cit**, 1-9.

Bryant R.L., 1994, "Shifting the Cultivator: The Politics of Teak Regeneration in Colonial Burma", in **Modern Asian Studies**, V 28 (2), 225-250.

Bryman A., 1984, "The debate about quantitative and qualitative research; a question of method or epistemology" in **The British Journal of Sociology**, V 35 (1), 75-92.

Budowski G., 1982, "The socio-economic effects of forest management on the lives of people living in the area: the case of Central America and some Caribbean countries" in Hallsworth E.G. (ed), 1982, **op cit**, 87-102.

Bunch R., 1982, **Two Ears of Corn: A Guide to People-Centred Agricultural Improvement**, World Neighbours, Olklahoma, USA.

Burley J., 1982, **Obstacles to Tree Planting in Arid and Semi-Arid Lands: Comparative Case Studies from India and Kenya**, The United Nations University.

Burnell P., 1992, "Debate: NGOs and Poverty, Third World Charities in a Changing World", in **Community Development Journal**, July 1992, V 27 (3), 290-302.

Burnell P., 1993, "Debate: Third World Charities in Britain towards 2000", in **Community Development Journal**, January 1993, V 28 (1), 66-81.

Butcher D., 1988, "Human and Institutional Development" in Conroy C. and Litvinoff M. (eds), 1988, **op cit**, 195-209.

Callanta R., 1988, "NGO - Private Sector Collaboration" in **Development: Journal of the Society for International Development**, V 1, 49-52.

Carruthers I. and Chambers R., 1981, "Rapid Appraisal for Rural Development", in **Agricultural Administration**, 1981, V 8, 407-422.

Cernea M., 1987, "Alternative Social Forestry Development Strategies" in **Selected Articles from Agroforestry Systems: an international journal**, 159-190.

Cernea M., 1988, "Land Tenure Systems and Social Implications of Forestry Development Programs" in Fortmann L. and Bruce J.W., 1988, **op cit**, 139-148.

Cernea M., 1989, **User Groups as Producers in Participatory Afforestation Strategies**, World Bank Discussion Paper No. 70, World Bank, Washington DC.

Chambers R., 1983, **Rural Development: Putting the Last First**, Longman Scientific and Technical, England.

Chambers R., 1987, **Sustainable Rural Livelihoods: A Strategy for People, Environment and Development**, Commissioned Study No. 7, Institute of Development Studies, Sussex.

Chambers R. and Leach M., 1989, "Trees as Savings and Security for the Rural Poor" in **World Development**, V 17 (3), 329-342.

Chambers R., Saxena N.C. and Shah T., 1989, **To the Hands of the Poor: Water and Trees**, Oxford and IBH Publishing Co. PVT Ltd, New Delhi.

Charlton P., 1991, "AIDAB's Approach to NTT Development", in Barlow C., Bellis A. and Andrews K. (eds), 1991, **op cit**, 215-222.

Clark J., 1991, **Democratizing Development: The Role of Voluntary Organizations,** Kumarian Press, U.S.A.

Cohen J.M. and Uphoff N.T., 1980, "Participations Place in Rural Development: Seeking Clarity through Specificity" in **World Development,** V 8, 213-235.

Collinson M., 1981, "A Low Cost Approach to Understanding Small Farmers", in **Agricultural Administration,** V 8, 433-450.

Conroy C., 1988, "Conclusions" in Conroy C. and Litvinoff M. (eds), 1988, **op cit,** pp 287-293.

Conroy C. and Litvinoff M. (eds), 1988, **The Greening of Aid: Sustainable Livelihoods in Practice,** Earthscan Publications Ltd in association with The International Institute for Environment and Development, London.

Conway F.J., 1988, "Agroforestry Outreach Project, Haiti" in Conroy C. and Litvinoff M. (eds), 1988, **op cit,** 78-83.

Conway G.R., 1985, "Agroecosystem Analysis" in **Agricultural Administration,** 1985, V 20, 31-55.

Conway G.R. and McCauley D.S., 1983, "Intensifying Tropical Agriculture; the Indonesian Experience" in **Nature,** 1983, V 302, 288-9.

Cook T.D. and Reichardt C.S. (eds), 1979, **Qualitative and Quantitative Methods in Evaluation Research,** Sage Publications, Beverly Hills, London.

Corner L., 1991, "Health, Education and Social Services in NTT: Social Development in a Poor Province", in Barlow C., Bellis A. and Andrews K. (eds), 1991, **op cit,** 39-51.

Craven I., 1991, **Conservation and Management of Wasur National Park, Irian Jaya, Indonesia: Progress Report June - December 1991,** World Wide Fund for Nature Project, Indonesia.

Cunha de I., "LSM: Antara Peluang dan Tantangan" in BKKKS and OXFAM, 1992, **op cit,** 14-15.

Danenberg J.M., 1988, **Australian Non-Government Organizations' Involvement in Third World Forestation: A Comparative Analysis,** Unpublished Honours thesis, Department of Geography, University of Adelaide.

Darrow K. and Saxenian M., 1986, **Appropriate Technology Sourcebook,** A Volunteers in Asia Publication, U.S.A.

Daru R.D. and Tips W.E.J., 1987, "Farmers Participation and Socio-Economic Effects of a Watershed Management Programme in Central Java (Solo River Basin, Wiroko Watershed)" in **Selected Articles from Agroforestry Systems: an international journal,** 162-183.

Datta F.U., 1993, **Socio-economic survey of communities adjoining forest areas on Sumba,** Fakultas Peternakan, Universitas Nusa Cendana, Kupang.

Dauvergne P., 1994, "The Politics of Deforestation in Indonesia", in **Pacific Affairs,** Winter 1993-94, V 66 (4), 497-518.

Davidson J., 1987, **Strategies for Implementing Social Forestry in West Nusa Tenggara: A Case Study in Southern Lombok,** Government of Indonesia, Indonesia.

Delforce J.C. and Potter L.M, 1991, **Mirco-level Studies and Policy Analysis: Experiences from Tonga and South Kalimantan,** Paper presented to the Development Studies Conference on Mechanisms of Socio-Economic Change in Rural Areas, Canberra, November 25-27 1991.

Departemen Kehutanan, 1986, **Feasibility Study: Proyek Reboasasi dan Penghijauan daerah aliran sungai, Pulau Sumba Propinsi Dati I NTT,** Departemen Kehutanan, Tingkat I, NTT.

Departemen Kehutanan, 1987, **Rencana Umum Kehutanan Propinsi Daerah Tingkat I, Nusa Tenggara Timur (1 April 1984 s/d 31 Maret 1999),** Kantor Wilayah Departemen Kehutanan, NTT.

Departemen Kehutanan, 1989, **Statistik Kehutanan: Propinsi Nusa Tenggara Timur, 1988-89,** Departemen Kehutanan, Kantor Wilayah, Propinsi Nusa Tenggara Timur.

Departemen Kehutanan, 1990, **Draf Rencana: Pembangunan Lima Tahun Kelima, Kehutanan Propinisi Dati I, Nusa Tenggara Timur,** Departemen Kehutanan, Kantor Wilayah Propinsi Nusa Tenggara Timur, Kupang.

Djemarut P., 1991, "The Implementation of Regional Development Programmes (PPW) in NTT", in Barlow C., Bellis A. and Andrews K. (eds), 1991, **op cit,** 181-194.

Djogo A.P.Y., 1990, **The Possibilities of Using Local Drought Resistant and Multipurpose Tree Species as Alternatives to Lamtoro (Leucaena leucocephala) for Agroforestry and Social Forestry in West Timor,** Environment and Policy Institute, East-West Center, Honolulu, Hawaii.

Djogo A.P.Y, Asa Y. and Nurak V., 1992, **Promoting agroforestry techniques: Experiences with participatory development process and farmers based extension strategy of an NGO from Nusa Tenggara Timur, Indonesia,** Paper presented to the Regional Expert Consultation on Farmer to Farmer Adaptive Agroforestry Research, Cebu, Phillipines 4-10 October 1992.

Dostoyevsky F., 1866, "Crime and Punishment", in Gibian G. (ed), 1975, **Crime and Punishment: The Coulson Translation,** W.W. Norton and Company Inc., New York, USA.

Dove M.R., 1986, "Peasant versus Government Perception and Use of the Environment: A Case Study of Banjarese Ecology and River Basin Development in South Kalimantan" in **Journal of Southeast Asian Studies,** V 17 (1), 113-136.

Dove M.R., 1987, "The Perceptions of Peasant Land Rights in Indonesian Development: Causes and Implications" in Raintree J.B. (ed), **op cit,** 265-271.

Drabek A.G., 1987, "Development Alternatives: The Challenge for NGOs - An Overview of the Issues" in **World Development,** V 15 Supplement, ix-xv.

Duffield M., 1992, "Book Review of Korten D.C. (1990), 'Getting to the 21st: Voluntary Action and the Global Agenda', Clark J. (1991), 'Democratizing Development the Role of Voluntary Organisations' and Remenyi J. (1991), 'Where Credit is Due: Income Generating Programmes for the Poor in Developing Countries'" in **Development and Change,** V 24 (2), 368-370.

Duggan K., 1991, "Land and Environment in NTT", in Barlow C., Bellis A. and Andrews K. (eds), 1991, **op cit,** 31-38.

Dwaraki B.R. and Narayanasamy N., 1992, "Let us now listen to them - A flashback on PRA" in **Journal of Rural Development,** V 11 (6), 853-862.

Edwards M., 1989, "The irrelevance of development studies" in **Third World Quarterly**, January 1989, 116-135.

Ellman A., 1981, "Rapid Appraisals for Rural Project Preparation" in **Agricultural Administration**, V 8, 463-471.

FAO, 1989, **Forestland for the People: A Forest Village Project in Northeast Thailand**, Food and Agriculture Organisation of the United Nations, Bangkok.

FAO, 1992, **Reforestation of Critical Watersheds in NTT**, Indonesia 2621.

FAO/FFHC, 1987, "NGOs in Latin America: their contribution to participatory democracy" in **Development: Journal of the Society for International Development**, V 4, 100-105.

Farrell J., 1990, "The Influence of Trees in Selected Agroecosystems in Mexico" in Gliessman S.R. (ed), 1990, **Agroecology: Researching the Ecological Basis for Sustainable Agriculture**, 169-183.

Fernandez H., 1991, "Opening Address", in Barlow C., Bellis A. and Andrews K. (eds), 1991, **op cit**, 7-13.

Fernandez M.S.O., 1991, "The Role of LSM/LPSM (NGOs)", in Barlow C., Bellis A. and Andrews K. (eds), 1991, **op cit**, 195-200.

Filstead W.J. 1979, "Qualitative Methods: A needed perspective in evaluation research", in Cook T.D. and Reichardt C.S. (eds), 1979, **op cit**, 33-48.

Fisher L., 1992a, **From Kebe and Lamtoronisasi to Farm Planning: Experiences Promoting Alley Farming, Soil Conservation, and Uplands Development in Southeastern Indonesia**, Paper presented to the International Conference on Alley Farming, IITA, Ibadan, Nigeria, 14-18 September, 1992.

Fisher L., 1992b, **Agricultural Development in the Uplands: How Conventional Agricultural Extension Systems Have Failed Resource-poor Farmers, and What to Do About It**, Paper presented to the Regional Meeting on Basic Education and the Environment, Berastagi, North Sumatera, Indonesia, 5-9 October, 1992.

Fisher L., 1993, **Changing Landscapes in the Uplands: Issues, Stakeholders and Institutional Responses**, Paper presented to the Workshop on the Status and Development of Dryland Farming in Indonesia, Mataram, Lombok, 16-18 November 1993.

Fisher L.A., Fisher L.H. and Domingo I.V., 1993, **World Neighbours: Insular Southeast Asia, Three Year Operational Plan 1993-1996**, Mas, Bali, Indonesia.

Foresta H. de and Michon G., 1994, "Agroforests in Sumatra: where ecology meets economy", in **Agroforestry Systems**, Oct-Dec 1994, 12-13.

Forth G.L., 1981, **Rindi: an ethnographic study of a traditional domain in eastern Sumba**, Martinus Nijhoff, The Hague.

Fortmann L., 1988, "The Tree Tenure Factor in Agroforestry with Particular Reference to Africa" in Fortmann L. and Bruce J.W., 1988, **op cit**, 16-33.

Fortmann L. and Bruce J.W. (eds), 1988, **Whose Trees? Proprietary Dimensions of Forestry**, Westview Press, Boulder and London.

Fox J., 1993, "The Tragedy of the Open Access", in Brookfield H. and Byron Y. (eds), **op cit**, 302-315.

Fox J.J., 1977, **Harvest of the Palm: Ecological Change in Eastern Indonesia**, Harvard University Press, Cambridge, Massachusetts and London, England.

Fox J.J. (ed), 1980, **The Flow of Life: Essays on Eastern Indonesia**, Harvard University Press, England.

Fox J.J., Garnaut R.G., McCawley P.T. and Mackie J.A.C. (eds), 1980, **Indonesia: Australian Perspectives**, Research School of Pacific Studies, The Australian National University, Canberra.

Francis C., 1993, "Rural Development, People's Participation and The Role of NGOs" in **Journal of Rural Development**, V 12 (2), 205-210.

Fujisaka S., 1989, "The need to build upon farmer practice and knowledge: reminders from selected upland conservation projects and policies", in **Agroforestry Systems: an international journal**, Vol. 9 141-153.

Ghai D., 1990, "Participatory Development: Some Perspectives from Grassroots Experience" in Khan A.R. and Sobhan R. (eds), **Trade, Planning and Rural Development**, 79-115.

Glassner B. and Moreno J.D. (eds), 1989, **The Qualitative-Quantitative Distinction in the Social Sciences**, Kluwer Academic Publishers, Dordrecht, Boston, London.

Gliessman S.R. (ed), 1990, **Agroecology: Researching the Ecological Basis for Sustainable Agriculture**, Springer Verlag New York Inc.

Godoy R.A., 1992, "Determinants of Smallholder Commercial Tree Cultivation" in **WorldDevelopment**, V 20 (5), 713-725.

GOI, 1980, **Kabupaten Sumba Timur: Fakta dan Penjelasan**, Publikasi No. 174, Direktorat Tata Guna Tanah dan Dirjen Agraria Depdagri.

Goswami P.C., 1988, "Agro-forestry: Practices and Prospects as a Combined Land Use System" in Fortmann L. and Bruce J.W. (eds), 1988, **op cit**, 297-300.

Gregersen H., Draper S. and Elz D. (eds), 1989, **People and Trees: The Role of Social Forestry in Sustainable Development**, EDI Seminar Series, The World Bank, Washington DC.

Guha R., 1989, **The Unquiet Woods: Ecological Change and Peasant Resistance in the Himalaya**, Oxford University Press, Delhi.

Hallsworth E.G. (ed), 1982, **Socio-economic Effects and Constraints in Tropical Forest Management**, John Wiley and Sons, U.S.A.

Hammer T., undated, **Tanzania Woodfuel/Forestry Project: Socio-Economic Considerations**, Working Paper No. 1.

Handawella J., 1989, "Agriculture under simulated forest: an alternative to shifting cultivation" in Van der Heide J. (ed), **op cit**, 375-380.

Hani A., 1992, "Membangun swadaya masyarakat, mulai dari lembaga" in BKKKS and OXFAM, 1992, **op cit**, 18-21.

Hardjono J. (ed), 1991a, **Indonesia: Resources, Ecology, and Environment**, Oxford University Press, New York.

Hardjono J., 1991b, "The Dimensions of Indonesia's Environmental Problems" in Hardjono J. (ed), 1991a, **op cit**, 1-16.

Hellinger S., Hellinger D. and O'Regan F.M., 1988, **Aid for Just Development: Report on the Future of Foreign Assistance**, Lynne Rienner Publishers, Boulder and London.

Hildebrand P.E., 1981, "Combining Disciplines in Rapid Appraisal: The Sondeo Approach" in **Agricultural Administration**, 1981, V 8, 423-432.

Hoekstra D.A., 1987, "Economics of Agroforestry" in **Selected Articles from Agroforestry Systems: an international journal**, Martinus Nijhoff/Dr W Junk Publishers in co-operation with ICRAF, 154-161.

Holden S.T. and Joseph L.O., 1991, "Farmer Participatory Research and Agroforestry Development - A Case Study From Northern Zambia" in **Agricultural Systems**, V 36, 173-189.

Holloway R., 1984, "KRING - Stimulating Community Development in Upland Central Java" in **Community Development Journal**, 1984, V 4 (1), 3-6.

Holloway R. (ed), 1989a, **Doing Development: Government, NGOs and the Rural Poor in Asia**, Earthscan Publications Ltd, London, in association with CUSO.

Holloway R., 1989b, "Partners in Development? The Government and NGOs in Indonesia" in Holloway R. (ed), 1989a, **op cit**, 136-160.

Holloway R., 1989c, "Afterword: Where to next? Governments, NGOs and Development Practitioners" in Holloway R. (ed), 1989a, **op cit**, 211-224.

Jalaluddin M., 1977, "A Useful Pathological Condition of Wood", in **Economic Botany**, April-June 1977, V 31, 222-224.

James R.W. and Fimbo G.M., 1988, "Customary Land Law of Tanzania: Planting Trees as Tantamount to Ownership" in Fortmann L. and Bruce J.W. (eds), 1988, **op cit**, 188-193.

Jazairy I., 1988, "Development and People's Participation: the UN system in Relation to Poverty Alleviation" in **Development: Journal of the Society for International Development**, V 1, 56-59.

Jessup T.C. and Peluso N.L., 1985, **Ecological Patterns and the Property Status of Minor Forest Products in East Kalimantan Indonesia**, Paper presented at the BOSTID-NRC Conference in Common Property Resource Management, Annopolis, Maryland.

Jones J., 1988, "Socio-Cultural Constraints in Working With Small Farmers in Forestry: Case of Land Tenure in Honduras" in Fortmann L. and Bruce J.W., 1988, **op cit**, 155-161.

Jones P.H., 1983, "Lamtoro and the Amarasi Model from Timor" in **Bulletin of Indonesian Economic Studies**, V 19 (3), 106-112.

Jorgensen D.L., 1989, **Participant Observation: A Methodology for Human Studies**, Sage Publications, London.

Jumbulingam R. and Fernandes E.C.M., 1987, "Multipurpose trees and shrubs of farmlands in Tamil Nadu State (India)" in **Selected Articles from Agroforestry Systems: an international journal**, 351-366.

Kaimowitz D., 1993, "The Role of Nongovernmental Organizations in Agricultural Research and Technology Transfer in Latin America" in **World Development**, V 21 (7), 1139-1150.

Kang B.T., Wilson G.F. and Lawson T.L., 1984, **Alley Cropping: A Stable Alternative to Shifting Cultivation**, IITA, Ibadan, Nigeria.

Kantor Statistik, 1989, **Indikator Ekonomi, Nusa Tenggara Timur**, Kantor Sensus dan Statistik Dati I NTT, Kupang, Indonesia.

Kantor Statistik, 1990, **Buku Kecamatan Dalam Angka 1990**, Kantor Statistik Tingkat II Kabupaten Sumba Timur, Waingapu.

Kantor Statistik, 1991a, **Sumba Timur Dalam Angka 1991**, Kantor Statistik Tingkat II Kabupaten Sumba Timur, Waingapu.

Kantor Statistik, 1991b, **Indikator Kesejahteraan Rakyat, Sumba Timur 1991**, Propinsi Nusa Tenggara Timur.

Kapita O.H., 1976, **Sumba di dalam Jangkauan Jaman**, Panitia Penerbit Naskah-Naskah Kebudayaan Daerah Sumba, Dewan Penata Layanan Gereja Kristen Sumba, Waingapu.

Kartasubrata J., 1990, "Socioeconomic aspects of agroforestry case studies in Japan, Thailand and Indonesia" in SEAMEO BIOTROP, 1990, **op cit**, 177-195.

Kartawinata K., 1993, "A Wider View of the Fire Hazard", in Brookfield H. and Byron Y. (eds), **op cit**, 261-266.

Kate H.F.C. ten, 1894, "Verslag: Eener Reis in de Timorgroep en Polynesie" in **Tijdschrift van het Koninklijk Nederlandsch Aardrijkskundig Genootschap**, 11: 541-638.

Khan A.R. and Sabhan R. (eds), 1990, **Trade, Planning and Rural Development**, MacMillan Press Ltd, London.

King K.F.S., 1988, "Agri-Silviculture (Taungya System): The Law and the System" in Fortmann L. and Bruce J.W. (eds), 1988, **op cit**, 301-305.

Kircher Lumbao L., 1991, **Trip Report**, of a WN/YTN intern from Yale University, visiting East Sumba in June-July 1991.

Kisscon T. and Carrier J., 1991, **Sumba: A Unique Culture**, Nafisa Productions, Waikabubak, Indonesia.

Kleden L., 1992, "Gerakan LSM: Antara Idealisme dan Kenyataan", in BKKKS and OXFAM, 1992, **op cit**, 9-12.

Kloos P. and Claessen H.J.M. (eds), 1991, **Contemporary Anthropology in the Netherlands: The Use of Anthropological Ideas**, VU University Press, Amsterdam.

Kuipers J.C., 1990, **Power in Performance: The Creation of Textual Authority in Weyewa Ritual Speech**, University of Pennsylvania Press, USA.

Kunstadter P., 1978, "Alternatives for the Development of Upland Areas" in Kunstadter P., Chapman E.C. and Sabhasri S. (eds), 1978, **op cit**, 289-308.

Kunstadter P. and Chapman E.C., 1978, "Problems of Shifting Cultivation and Economic Development in Northeast Thailand" in Kunstadter P., Chapman E.C. and Sabhasri S. (eds), 1978, **op cit**, 3-23.

Kunstadter P., Chapman E.C. and Sabhasri S. (eds), 1978, **Farmers in the Forest: Economic Development and Marginal Agriculture in Northern Thailand**, University Press of Hawaii, Honolulu.

Lahjie A.M. and Seibert B. (eds), 1988, **Agroforestry: untuk pengembangan daerah pedesaan di Kalimantan Timur**, Presiding seminar 19-21 September 1988, Kerja sama antara Fakultas Kehutanan Universitas Mulawarman dengan Deutsche Gessellschaft Fuer Technische Zusammenarbeit (GTZ)/German Forestry Group, Samarinda.

Lea D., 1992, "Does aid help? Sustainable Development without (necessarily) being 'green'" in **Development Bulletin**, April 1992, V 23, 17-20.

Lee J.L., 1994, **Deriving Strategies for Forest Conservation from the Relationship Between Forests and People in Sumba, Indonesia**, unpublished report, Dept. of Geography, University of Adelaide.

Lele S.M., 1991, "Sustainable Development: A Critical Review" in **World Development**, V 19 (6), 607-621.

Lewin E., 1988, "The Qualities of Smallness" in **Development: Journal of the Society for International Development**, V 4, 31-35.

Lian F.J., 1993, "On Threatened Peoples", in Brookfield H. and Byron Y. (eds), 1993, **op cit**, 322-337.

Lundgren B.O., 1989, "Institutional and policy aspects of agroforestry" in Nair P.K.R. (ed), 1989, **Agroforestry Systems in the Tropics**, 601-607.

Lundgren B.O., 1991, "Agroforestry Research for Development: Commentary" in **Agroforestry Today**, V 3 (3), 6-7.

MAB Indonesia, 1990, **Pengamatan, Studi dan Percobaan Perhutanian di Lahan Kering Pulau Timor, Nusa Tenggara Timur**, Kerja sama antara Lembaga Ilmu Pengetahuan Indonesia dan Panitia Nasional Program MAB Indonesia, Bogor.

MacDicken K.G. and Vergara N.T. (eds), 1990a, **Agroforestry: Classification and Management**, John Wiley and Sons, New York.

MacDicken K.G. and Vergara N.T., 1990b, "Extension and Agroforestry Technology Delivery to Farmers" in MacDicken K.G. and Vergara N.T. (eds), 1990a, **op cit**, 354-373.

Madiath J., 1989, "Siro Mallik Goes to Buy a Pair of Bullocks and a Cart", in Holloway R. (ed), 1989a, **op cit**, 41-52.

Manicas P.T., 1989, "Explanation and Quantification", in Glassner B. and Moreno J.D. (eds), **op cit**, 179-205.

Manuwoto, 1991, "Approaches to Regional Development in Indonesia and the NTT", in Barlow C., Bellis A. and Andrews K. (eds), 1991, **op cit**, 53-62.

McDonald R., 1968, **Citizens of Mist**, University of Queensland Press.

McNeely J.A. and Pitt D. (eds), 1985a, **Culture and Conservation: The Human Dimension in Environmental Plannning**, Croom Helm Australia Pty Ltd, Sydney.

McNeely J.A. and Pitt D., 1985b, "Culture: The Missing Element in Conservation and Development" in McNeely J.A. and Pitt D. (eds), 1985a, **op cit**, 1-9.

Metzner J.K., 1982, **Agriculture and Population Pressure in Sikka, Isle of Flores: A contribution to the study of the stability of agricultural systems in the wet and dry tropics**, Canberra Development Studies Centre Monograph, ANU, No. 28, 1-355.

Metzner J., 1983, "Innovations in Agriculture Incorporating Traditional Production Methods: The Case of Amarasi (Timor)", in **Bulletin of Indonesian Economic Studies**, V 19 (3), Dec. 1983, 94-105.

Mills D.O., 1988, "Direct Funding Implications for Caribbean NGOs" in **Development: Journal of the Society for International Development**, V 4, 19-25.

Minear L., 1987, "NGOs today: practitioners of development strategies and advocates for the poor" in **Development: Journal of the Society for International Development**, V 4, 96-99.

Mnzava E.M., 1983, **Tree Planting in Tanzania: A Voice From Villagers**, Dar es Salaam.

Mol P.W. and Wiersum K.F., 1990, **Communal Management of Forests in South and Southeast Asia**, Department of Forestry, Agricultural University Wageningen, the Netherlands.

Moffat D., 1991, "The NTTIADP and NTASP Schemes", in Barlow C., Bellis A. and Andrews K. (eds), 1991, **op cit**, 201-214.

Moore M., 1979, "Denounce the Gang of Statisticians, Struggle Against the Sample Line, Unite the Researching Masses Against Professional Hegemony", in **Rapid Rural Appraisal**, A conference held at the Institute of Development Studies, 4-7 December 1979, University of Sussex, Brighton.

Murray G.F., 1988, "The Wood Tree as a Peasant Cash Crop: An Anthropological Strategy for the Domestication of Energy" in Fortmann L. and Bruce J.W. (eds), **op cit**, 215-224.

Muthayya B.C. and Loganathan M., 1992, "Community Participation in Social Forestry (A dialogical Assessment)" in **Journal of Rural Development**, V 11 (6), 729-746.

Mylius B., 1987, **Community Development Specialist (Second Visit Report)**, Nusa Tenggara Timur Integrated Area Development Project Report.

Nair P.K.R. (ed), 1989, **Agroforestry Systems in the Tropics**, Kluwer Academic Publishers in co-operation with ICRAF, Netherlands.

Nair P.K.R., 1990, **The Prospects for Agroforestry in the Tropics**, World Bank Technical Paper No. 131, The World Bank, Washington DC.

Nair P.K.R., 1991, "State-of-the-art agroforestry systems" in **Forest Ecology and Management**, V 45, 5-29.

Nair P.K.R., Fernandes E.C.M. and Wambugu P.N., 1984, "Multipurpose leguminous trees and shrubs for agroforestry" in **Agroforestry Systems, an international journal**, V 2 (3), 145-163.

Needham R., 1980, "Principles and Variations in the Structure of Sumbanese Society", in Fox J.J. (ed), 1980, **op cit**, 21-47.

Nguyen Ngoc Luu, 1988, "Institutional Factors and Technological Innovations in Vietnam" in Ahmed I. and Ruttan V.W. (eds), 1988, **op cit**, 317-398.

Nibbering J.W., 1991, "Crisis and Resilience in Upland Land Use in Java", in Hardjono J. (ed), 1991a, **op cit**, 104-132.

Noronha R., 1980, **Village Woodlots are they a Solution, Paper prepared for Panel on the Introduction and Diffusion of Renewable Energy Technologies**, National Academy of Sciences, Washington D.C.

Onvlee L., 1980, "The Significance of Livestock on Sumba", in Fox J.J. (ed), 1980, **op cit**, 195-207.

Osmeobo G.J., 1989, "An Impact and Performance Evaluation of Smallholder Participation in Tree Planting, Nigeria" in **Agricultural Systems**, V 29, 117-135.

Overseas Development Institute, 1988, "Development Efforts of NGOs" in **Development: Journal of the Society for International Development**, V 4, 41-46.

Padoch C. and Peters C., 1992, "Managed Forest Gardens in West Kalimantan, Indonesia", paper submitted to Cohen J.L. and Potter C.S. (eds), **Case Studies of Genetic Resource Conservation in Natural Habitats: Biological and Socioeconomic Dimensions**, American Association for the Advancement of Science.

Patton M.Q., 1980, **Qualitative Evaluation Methods**, Sage Publications, Beverly Hills, London.

Peck R.B., 1984, "Traditional Forestation Strategies of Local Farmers in the Tropics" in Wiersum K.F., 1984, **op cit**, 205-216.

Peck R.P., 1990, "Promoting Agroforestry Practices Among Small Producers: The Case of the Coca Agroforestry Project in Amazonian Ecuador" in Anderson A.B. (ed), 1990, **op cit**, 167-180.

Pellokila C., Field S. and Momuat E.O., 1991, "Food Crops Development in NTT", in Barlow C., Bellis A. and Andrews K. (eds), 1991, **op cit**, 121-144.

Peluso N.L., 1992, **Rich Forests, Poor People: Resource Control and Resistance in Java**, University of California Press, Berkeley.

Peluso N.L., Poffenberger M. and Seymour F., 1990, "Reorienting Forest Management on Java" in Poffenberger M. (ed), 1990a, **op cit**, 220-236.

Pelzer K.J., 1978, "Swidden Cultivation in Southeast Asia: Historical, Ecological and Economic Perspectives" in Kunstadter P., Chapman E.C. and Sabhasri S. (eds), 1978, **op cit**, 271-286.

Penny D. and Ginting M., 1980, "Housegardens - The Last Resort? Further Economic Arithmetic from Sriharjo" in Fox J.J. *et al* (eds), 1980, **op cit**, 487-499.

Pereira H.C., 1989, **Policy and Practice in the Management of Tropical Watersheds**, Westview Press, Boulder and San Francisco.

Persoon G.A. and Wiersum F., 1991, "Anthropology in a Forest Environment" in Kloos P. and Claessen H.J.M. (eds), 1991, **op cit**, 85-104.

Petch B., 1991, "Issues to be considered as part of WN-SEA assessment", in World Neighbours, 1991, **op cit**, appendix II.

Pierce Colfer C.J., 1988, "Kenyah Dayak Tree Cutting: In Context" in Fortmann L. and Bruce J.W. (eds), 1988, **op cit**, 172-175.

Piggin C., 1991, "New Forage Technologies", in Barlow C., Bellis A. and Andrews K. (eds), 1991, **op cit**, 105-120.

Poffenberger M. (ed), 1990a, **Keepers of the Forest: Land Management Alternatives in Southeast Asia**, Kumarian Press, U.S.A.

Poffenberger M., 1990b, "The Evolution of Forest Management Systems in Southeast Asia", in Poffenberger M. (ed), 1990a, **op cit**, 7-26.

Potter L., 1991, "Environmental and Social Aspects of Timber Exploitation in Kalimantan, 1967-1989", Hardjono J. (ed), 1991a, **op cit**, 177-211.

Potter L., 1993, "The Onslaught on the Forests in South-East Asia", in Brookfield H. and Byron Y. (eds), 1993, **op cit**, 103-123.

Porter D., Allen B. and Thompson G., 1991, **Development in Practice: Paved with Good Intentions**, Routledge, London and New York.

Pos Kupang, Daily newspaper of the province of Nusa Tenggara Timur, Indonesia.

Postman N., 1992, **Technopoly: the surrender of culture to technology**, Vintage, New York.

Rahim R., 1988, "The Role of Agroforestry Development in the Surrounding of Catchment Areas in Samarinda" in Lahjie A.M. and Seibert B. (eds), 1988, **op cit**, 57.

Rahman M.A., 1981, "Participation of the Rural Poor in Development" in **Development: Journal of the Society for International Development**, V 1, 3-15.

Raintree J.B. (ed), 1987, **Land, Trees and Tenure: Proceedings on an International Workshop on Tenure Issues in Agroforestry**, ICRAF and the Land Tenure Center, Nairobi and Madison.

Reichardt C.S. and Cook T.D., 1979, "Beyond Qualitative versus Quantitative Methods" in Cook T.D. and Reichardt C.S. (eds), **op cit**, 7-32.

Richards P., undated, **Geography is a bottle of Heinekan Lager Beer - How to be the most boring person in development planning and still get your facts wrong**, Geography Department, School of Oriental and African Studies, London.

Rigg J., 1991, "Grass-Roots Development in Rural Thailand, A Lost Cause ?" in **World Development**, V 19 (213), 199-211.

Robson C., 1994, **Real World Research: A Resource for Social Scientists and Practitioner-Researchers**, Blackwell, Oxford and Cambridge, USA.

Rocheleau D.E., 1988, "Women, Trees and Tenure: Implications for Agroforestry" in Fortmann . and Bruce J.W. (eds), 1988, **op cit**, 254-272.

Roos S., 1872, "Bijdrage tot de Kennis van taal, land en volk op het eiland Soemba" in **Verhandelingen van het Bataviaasch Genootschap van Kunsten en Wetenschappen**, 36, 1-126.

Sani H.B., 1990, "Agroforestry in Sarawak; Malaysia: Recent Development" in SEAMEO BIOTROP, 1990, **Agroforestry Systems and Technologies**, BIOTROP Special Publication No. 39, 37-43.

Schwarz A., 1994, **A Nation in Waiting: Indonesia in the 1990s**, Allen and Unwin, Australia.

Scott J.C., 1985, **Weapons of the Weak: Everyday Forms of Peasant Resistance**, Yale University Press, New Haven and London.

Scott J.C., 1990, **Domination and the Arts of Resistance: Hidden Transcripts**, Yale University Press, New Haven and London.

SEAMEO BIOTROP, Southeast Asian Regional Center for Tropical Biology, 1990, **Agroforestry Systems and Technologies**, BIOTROP Special Publication No. 39, Bogor, Indonesia.

Seavoy R.E., 1975, "The origin of tropical grasslands in Kalimantan, Indonesia", in **The Journal of Tropical Geography**, June 1975, V 40, 48-52.

Sediono M.P. Tjondronegoro, 1987, "Notes on Tenure and Agroforestry in Indonesia" in Raintree J.B. (ed), 1987, **op cit**, 253-259.

Simpson S., 1991, **An Alternative Approach to the Implementation of Agricultural Development Projects in Nusa Tenggara Timur**, Paper presented at a conference on agroforestry, Politeknik Pertanian, Universitas Nusa Cendana, Kupang.

Sinaga N., 1990, **Pertanian lahan kering sebagai wadah partisipasi Yayasan Tana Nua dalam peningkatan kesejahteraan masyarakat NTT**, Paper presented at an Informal meeting about Dryland Agriculture in Nusa Tenggara, Kupang, 13-14 August 1990.

Siregar A.M., Sudradjat A. and Darmomihardjo S., 1990, "Implementation of Agroforestry in Indonesia" in SEAMEO BIOTROP, 1990, **op cit**, 29-35.

Soemarwoto O., 1991, "Human Ecology in Indonesia: The Search for Sustainability in Development", in Hardjono J. (ed), 1991a, **op cit**, 212-235.

Soetrisno L., 1987, "Notes on Agroforestry Projects in Developing Countries" in Raintree J.B. (ed), 1987, **op cit**, 261-263.

Stoney C., undated, **Site Visit Reports: Tananua Program, Sumba, NTT**, part of an annex of a report on agroforestry in Nusa Tenggara.

Stoney C. and Bratamihardja, 1990, "Identifying Appropriate Agroforestry Technologies in Java" in Poffenberger M. (ed), 1990a, **op cit**, 145-160.

Streeten P., 1987, "The contribution of non-government organisations to development" in **Development: Journal of the Society for International Development**, V 4, 92-95.

Suardika P. and Fisher L., 1990, "Pengalaman Pembinaan Petani di Daerah Penyangga di Hutan Wanggameti, Sumba Timur, NTT" in **Prosiding Seminar Nasional Pengelolaan Kawasan Penyangga** diselenggarkan di Jayapura tanggal 16 dan 17 Oktober 1990, Kerjasama Kantor Wilayah Departemen Kehutanan Propinsi Irian Jaya dengan World Wide Fund for Nature Program Irian Jaya.

Sukandi T., 1990, "Tumpangsari (Taungya) System in Indonesia: A Bio-Ecological Review" in SEAMEO BIOTROP, 1990, **op cit**, 99-106.

Susanto, 1992, "Masyarakat Demokratis: Masyarakat Mandiri" in BKKKS and OXFAM, 1992, **op cit**, 13.

Swift J., 1981, "Rapid Appraisal and Cost-Effective Participatory Research in Dry Pastoral Areas of West Africa" in **Agricultural Administration**, 1981, V 8, 485-492.

Terrent J. and Poerbo H., 1989, "Strengthening Community-Based Technology Management Systems" in Holloway R. (ed), 1989a, **op cit**, 161-176.

Thijs De La Court, 1990, **Beyond Brundtland: Green Development in the 1990s**, Zed Books Ltd., London and New Jersey.

Thomson J.T., 1988, "Participation, Local Organization, Land and Tree Tenure: Future Directions for Sahelian Forestry" in Fortmann L. and Bruce J.W. (eds), **op cit**, 204-214.

Tjitrosomo S.S., Kartasubrata J. and Umaly R.C. (eds), 1990, **Agroforestry Systems and Technologies**, Southeast Asian Center for Tropical Biology, BIOTROP Special Publication No. 39, Bogor, Indonesia.

Tjondronegoro S.M.P., 1991, "The Utilization and Management of Land Resources in Indonesia, 1970-1990", in Hardjono J. (ed), 1991a, **op cit**, 17-35.

Trainer T., 1989, **Developed to Death: Rethinking Third World Development**, Green Print, London.

Tucker R.P., 1984, "The Historical Context of Social Forestry in the Kumaon Himalayas" in **The Journal of Developing Areas**, April 1984, V 18, 341-356.

UNDP/FAO, 1982a, **National Conservation Plan for Indonesia: Vol. IV Nusa Tenggara**, Field report of UNDP/FAO National Parks Development Project, Bogor, Indonesia.

UNDP/FAO, 1982b, **Feasibility Studies of Potential Reserves of Sumba Island**, UNDP/FAO field report for Directorate of Nature Conservation, Bogor, Indonesia.

UNDP/World Bank, 1988, **Tanzania Woodfuel/Forestry Project: Activity Completion Report**, Report of the Joint UNDP/World Bank Energy Sector Management Assistance Program.

Uphoff N., 1993, "Grassroots Organizations and NGOs in Rural Development: Opportunities with Diminishing States and Expanding Markets" in **World Development**, V 21 (4), 607-622.

Van der Heide J. (ed), 1989, **Nutrient Management for Crop Production in Tropical Farming Systems**, Institute of Soil Fertility, IBRA Haren, The Netherlands.

Van Dijk M.P., 1987, "Collaboration between government and non-government organizations" in **Development: Journal of the Society for International Development**, V 4, 117-121.

Vayda A.P., Pierce Colfer C.J. and Brotokusumo, 1985, "Interactions between people and forests in East Kalimantan" in McNeely J.A. and Pitt D. (eds), 1985, **op cit**, 211-227.

Verheijen J.A.J., 1990, **Dictionary of Plant Names in the Lesser Sunda Islands**, Department of Linguistics, Research School of Pacific Studies, The Australian National University.

Von Maydell H.J., 1988, "Penelitian Terapan Dalam Agroforestry", in Lahjie A.M. and Seibert B. (eds), 1988, **op cit**, 3-6.

Von Maydell H.J., 1991, "Agroforestry for tropical rainforests", in **Agroforestry Systems: an international journal**, V 13, 259-267.

Vorauri P., 1982, "The agroforestry system at Mae Muang Luang, Thailand" in Hallsworth E.G. (ed), **op cit**, 103-106.

WALHI, 1991, **Himpun Data, Lembaga Swadaya Masyarakat Linkungan Hidup di Indonesia**, produced by Wahana Lingkungan Hidup Indonesia.

Walters S., 1993, "Non-governmental organisations and the South African state: present and future relations", in **Community Development Journal**, January 1993, V 28 (1), 1-10.

Watson D. and Holloway R., 1989, **Changing Focus: Involving the Rural Poor in Development Planning**, Mohan Primlani for Oxford and IBH Publishing Co., New Delhi.

Watson D. and Team and Issa T., 1989, "Good Manners with the Rural Poor", in Holloway R., 1989a, **op cit**, 185-199.

Webb L.J., 1982, "The Human Face in Forest Management" in Hallsworth E.G. (ed), 1982, **op cit**, 159-175.

Werner F., undated, **Tanzania Woodfuel/Forestry Project: Institutional Aspects**, Working Paper No. 6.

West P.C., 1983, "Collective Adoption of Natural Resource Practices in Developing Nations" in **Rural Sociology**, V 48 (1), 1983, 44-59.

Wiersum K.F. (ed), 1984, **Strategies and Designs for Afforestation, Reforestation and Tree Planting**, Pudoc Wageningen, Netherlands.

Wignaraja P., 1984, "Towards a Theory and Practice of Rural Development" in **Development: Journal of the Society for International Development**, 1984, V 2, 3-11.

Wignaraja P., 1989, "Ten Years of Experience with Participatory Action Research in South Asia - Lessons for NGOs and Peoples' Organizations" in Holloway R. (ed), 1989a, **op cit**, 30-40.

Wirawan N., 1993, "The Hazard of Fire", in Brookfield H. and Byron Y., 1993, **op cit**, 242-260.

Wodicka S., Jackson J. and Domingo I.V., 1994, **World Neighbours Strategic Plan for Insular Southeast Asia 1995**, Mas, Bali.

World Neighbours, 1991, **Southeast Asia: Area Assessment 1981-1991**, report assessing World Neighbours programmes in the region, Olklahoma, USA.

World Neighbours and Studio Driya Media, 1988, **Usaha Tani Terpadu: Petunjuk Praktis Pertanian Lahan Kering**, Indonesia.

Yayasan Tananua, 1992, **Laporan Kegiatan Tahun 1991/1992**, Nusa Tenggara Timur, Indonesia.

Yayasan Tananua, 1993, **Laporan Tahunan 1992/1993**, Nusa Tenggara Timur, Indonesia.

Yayasan Tananua, 1994, **Laporan Kegiatan Tahun 1993/1994**, Nusa Tenggara Timur, Indonesia.

Zainuddin M. and Sweeting P., 1989, "Encouraging the Poor to Help Themselves" in Holloway R. (ed), 1989a, **op cit**, 177-184.