

Post-project Sustainability Analysis Using Complex System Approach:
A Case Study in Microfinance (Revolving Loan Fund Project) in Indonesia



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“In the name of Allah, the most beneficent, the most merciful.”

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Declaration

I certify that this work contains no material which has been accepted for the award of any other degree or diploma in my name in any university or other tertiary institution and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made in the text. In addition, I certify that no part of this work will, in the future, be used in a submission in my name for any other degree or diploma in any university or other tertiary institution without the prior approval of the University of Adelaide and where applicable, any partner institution responsible for the joint award of this degree. The author acknowledges that copyright of published works contained within this thesis resides with the copyright holder(s) of those works.

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Papers arising from this thesis

Paper 1 (Chapter 2)

International Development Project Success: A Literature Review

Revision will be submitted to the Journal of International Development

Paper 2 (Chapter 3)

Complex System Approach to Post-Project Sustainability Evaluation of International Development Project: An Application in Revolving Loan Fund (Microfinance) Project

Revision submitted to the journal System Research and Behavioral Science.

Paper 3 (Chapter 4)

Microfinance Programme Sustainability Analysis Using Complex System Approach

Submitted to the journal of System Research and Behavioral Science (special issue)

Paper 4 (Chapter 5)

Exploring Factors Influencing the Sustainability of Project-Based Microfinance: A case Study in Revolving Loan Fund Project

Submitted to journal Studies in Comparative International Development (under review)

Abstract

Poverty and other human development issues remain a large global problem requiring a solution. The long-term effectiveness of international development projects aiming to address the issues is difficult to achieve. Even for projects that are successful in their implementation phase. One important criterion of long-term project success is sustainability which can provide long-term benefits to society. Microfinance potentially provides enduring solutions for poverty alleviation by providing permanent access to microcredit for the poor, yet it also faces challenges in its sustainability. Further, the complex characteristics of international development projects and their sustainability have created the need for a comprehensive and complex approach to projects. This study involved a post-project sustainability analysis of an international development project (microfinance/revolving loan fund) using a complex systems approach. The analysis resulted in the provision of a sustainability evaluation framework for an international development project and its application in a microfinance project; understanding the sustainability of microfinance projects through a complex systems approach; and exploration of factors that can influence the sustainability of microfinance projects.

This study used both qualitative and quantitative approaches with case study design in a microfinance (Revolving Loan Fund) project in Central Java Province, Indonesia. Data were collected through interviews, observation, document review, focus group discussions (FGDs) and a survey. The data collection was conducted in the province from October 2019 to December 2020. SPSS and NVivo software was used to analyse the data.

The results of the analysis are as follows. First, a framework to evaluate the sustainability of an international development project is proposed. The framework's application shows that a complex systems approach is applicable to post-project sustainability evaluation. Moreover, the case study showed that the project is sustainable. The study has implications for project sustainability and microfinance. First, the

framework provides more comprehensive information about the sustainability of a project. Second, microfinance programmes can be sustainable without subsidies and can achieve financial and social goals.

Second, the results revealed that some issues arose in response to the closure of the project, and actions were taken to cope with those issues. These are related to project governance, accountability, capital and profitability, competition and empowerment. The analysis also showed that the move towards a sustainable project presents characteristics of complex systems, including interconnectedness, adaptive capacity, feedback, self-organisation and emergence (IAFSE). Further, this study's findings have implications for microfinance sustainability management and programme design. First, they demonstrate the importance of effective stakeholder management, leadership and a network-based governance system. Second, they identify the importance of including flexibility in programme design; planning by the governing body, accountability and control mechanisms after project completion; equipping the community with knowledge and skills; and recruiting the right people.

Third, an exploration of factors that may influence the sustainability of microfinance projects showed that project-based microfinance (RLF) sustainability is influenced by local project characteristics, community support and project management. This implies that project implementation and its sustainability are concomitant. Further, project implementation that considers the local community and is supported by project management may play an essential role in the project's sustainability.

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List of Abbreviations

AMU	Activity Management Unit
CDD	Community-driven development
FGD	Focus group discussion
IAFSE	Interconnection, adaptation, feedback, self-organisation and emergence
IDP	International development project
IVF	Inter-village forum
MFI	Microfinance institution
PAR	Portfolio at risk
PNPM	Program Nasional Pemberdayaan Masyarakat
PRH	Public rental housing
RLF	Revolving loan fund
SDGs	Sustainable Development Goals
KMO	Kaiser–Meyer–Olkin
OSS	Operational self-sufficiency
ROA	Return on asset
ST	Stakeholder
SG	System Governance

Chapter 1: Introduction

This chapter presents the background to the research, including the specific background of the case study. Further, it describes the current understanding of the research topic, which informed the research questions and objectives. The research design and methodology that include steps and methods to conduct the research, are explained. Moreover, the significance of the study is discussed. Finally, this chapter describes the structure of the thesis.

1.1 Background

The large number of people living in poverty remains a global issue. Since the Millennium Development Goals (MDGs) programme ended in 2014, the United Nations has continued with poverty reduction initiatives through integrated international development initiatives called Sustainable Development Goals (SDGs) programmes. Addressing human development problems such as poverty is usually conducted through activities that are called projects/programs/interventions (so that these terms will be used interchangeably). Although anti-poverty projects have been implemented, data still show that many people are living below the poverty line. World Bank data show that the number of poor in March 2019 globally was around 731 million or 9.9% (Atamanov et al. 2019). In Indonesia, the percentage of people living below the poverty line in 2020 was estimated as 27.55 million (10.2% of the country's population); most of them live in rural areas (Indonesian Bureau of Statistics 2020). These statistics show that combating poverty is challenging.

The effectiveness of poverty alleviation programmes relates to their sustainability. The sustainability of a poverty alleviation project determines its long-term success in reducing poverty (Chuanmin et al. 2012). However, most human development projects have failed (Golini et al. 2015) to satisfy sustainability criteria (Morán & Ferguson 2013),

which is a persistent problem (Rudqvist et al. 2000). Forty per cent of all new development programmes are no longer running a few years after project completion (Hutaserani & Bayley 2010). Further, governments and international agencies have paid more attention to project approval and implementation, and less to project operation, maintenance, and sustainability of project outputs and outcomes (Hutaserani & Bayley 2010). Institutions are averse to conducting impact evaluation because of the time required, complexity, high cost, and low data quality and availability (Baker 1999), even though it is beneficial for funders and donors to measure the effectiveness of their utilisation of funds. Empirical studies have been conducted to address the question of project effectiveness (Denizer et al. 2013), but there is no consensus on how to assess project achievements. Some agree that aid projects are likely to lead to success; others argue that such projects are not effective (Ika 2015). Overall, the success of international development projects (IDPs) is considered below acceptable levels considering the funds invested (Diallo & Thuillier 2004).

Microfinance programmes are believed an effective development intervention to address poverty. Microfinance institutions (MFIs) including revolving loan funds (RLFs) that is defined as funds for microcredit to the poor with interest so that the fund can be revolved have double-bottom-line performance measures, namely profitability and providing loans for the poor to address poverty. Hence, sustainable microcredit is a potentially powerful poverty-alleviation tool that can provide permanent access to microcredit for the poor to increase their income, build assets and avoid external shocks (Helms 2006). Microfinance can significantly reduce poverty (Imai et al. 2012; Miled & Rejeb 2015) and income inequality (Hermes 2014; Lacalle-Calderon 2019) at the macro level. However, the sustainability of microfinance programmes, including community-managed revolving loan funds (RLFs), is challenging and difficult to achieve (Cheng & Li 2009; Ritchie 2005). Most MFIs face sustainability issues (Morduch 2000), with only

around 30% being sustainable (Dieckmann 2007). Many microfinance programmes are dependent on donor subsidies to cover high operational costs (Hermes & Lensink 2011), which tends to lose focus quickly and is prone to unsustainability (Brau & Woller 2004). Moreover, the issues of transferred assets, ownership, management and conditions at the end of RLF projects play significant roles in the sustainability of these projects (European Commission 2008).

Further, the linear model of input–output–outcome logic that has dominated the development field (Sarriot & Kouletio 2015) may be less effective for complex development projects. The complex characteristics of such development projects, repeated failure to meet goals for sustainable achievement, and global attempts to use holistic approaches have identified the need for complex and nonlinear models of intervention (Sarriot & Kouletio 2015). It has been agreed that a more comprehensive approach to sustainability is required (Espinosa et al. 2008).

The complexity approach provides a superior description and understanding of complexities in the real world (international development and humanitarian aid). It can assist practitioners and researchers in understanding and influencing economic, social and political phenomena (Ramalingam et al. 2008). The complexity concept also provides insights to complex problems more holistically and realistically (Ramalingam et al. 2008); it can refine some of the most general and basic characteristics and offers a more useful tool to deal with sustainability that requires integration of economic, cultural, social, political and ecological issues (Gallopín 2003). Further, understanding the sustainability of a development project by using complexity is vital for improving the long-term effectiveness of the project. Such understanding is important for learning (Cekan 2016; Hutaserani & Bayley 2010), refining future policies (Hutaserani & Bayley 2010) and contributing to the general body of knowledge (Khatiwada 2017). It is crucial to move beyond steady-state sustainability models for addressing complexity and volatility (Fiksel

2006) because change and adaptation of socio-technical systems over time are fundamental for transition to a more sustainable society (Tran 2014). The failure of non-holistic approaches to address complex problems is due to their focus on specific elements and the fact that they tend not to consider the interaction between components and recommend a one-size-fits-all solution (Jackson 2006).

Therefore, this study aims to provide a comprehensive analysis to understand post project sustainability by using a case study in a microfinance (RLF) project in Central Java, Indonesia. This study encompasses three specific topics discussed in three papers, namely post-project sustainability evaluation (Paper 2), analysing/understanding post-project sustainability (Paper 3) and exploration of post-project sustainability factors (Paper 4).

1.2 Case Study Background: The Microfinance (The Rural RLF) Project

The Indonesian government has conducted many programmes to alleviate poverty. In 2007 the government launched the National Rural Programme for Rural Community Empowerment (Program Nasional Pemberdayaan Masyarakat Perdesaan [PNPM Rural]), which included an RLF (microfinance) project that ended in 2015. The overarching goals of the PNPM Rural were to improve the welfare of the rural poor and increase employment; the specific purpose of the RLF project is to provide the poor with accessible finance. The project used a community-driven development (CDD) approach and was financed by the State Budget, the Regional Budget, and other donors such as the World Bank and the Asian Development Bank (ADB). The structure of the RLF project is depicted in Figure 1.

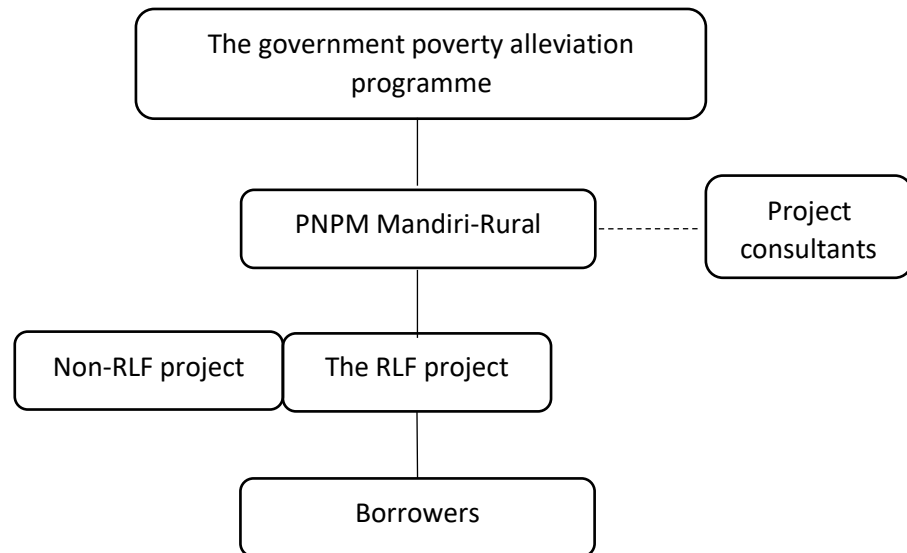


Figure 1: The RLF Project Structure

(Source from Pokja Pengendali PNPM Mandiri 2013 and PNPM Support Facility 2011)

The RLF project delivered small packets of credit to the poor via its community governing structure. Community institutions operated the project in sub-districts called Unit Pengelola Kegiatan (UPK, or Activity Management Units [AMUs], which have since become MFIs). These AMUs received grants and subsidies for microcredit and their operational costs from the government annually, then distributed the grants for microfinance to poor villagers. Lists of grantees were based on the recommendations of village leaders and approved by the Musyawarah Antar Desa (inter-village meeting).

A World Bank (2012) study found that only 28% of rural RLF projects in four provinces (Central Java, Yogyakarta, Nusa Tenggara Timor and West Sumatra) are operationally sustainable, with the best performance being by the RLF project in Central Java Province. The report also revealed that even though the project reaches a substantial number of borrowers, its portfolio quality and profitability/sustainability remain challenges. The community had a low understanding of the objectives of the project. Most of them perceived that the loan was a grant rather than a revolving loan, and thus believed they did not have to repay the money. There were also issues around skills and motivation

in the community. Further, the large amount of money handled by AMUs was not embedded within a legal framework. Therefore, it was likely that the financial performance of the RLF project would worsen as the project progressed.

After the project closed and grant and other subsidies ceased, the project began operating by AMUs which are independent from the government. This has increased uncertainty and vulnerability, which puts the project's sustainability at risk. Additionally, a project evaluation report found that the project was not supported by an effective exit strategy (PNPM Support Facility 2015). Despite these problems, most AMUs in Central Java Province continue to operate as MFIs by providing microcredit for villagers. This phenomenon interests and encourages the candidate to conduct research using the project as a case study.

1.3 Current Understanding of Research Topic

The literature demonstrates an insufficient number of studies on sustainability models and factors in international aid programmes relating to food, health and rural development (Lee 2017). There has been limited research on the sustainability of projects years after their completion (Myers et al. 2014), and most such studies come from health care (Herlitz et al. 2020). Around 99% of IDPs are unevaluated following termination of the project (Cekan 2016). Even though post-project evaluation could improve understanding of the factors determining project sustainability and connections to development impacts (Myers et al. 2014), current understanding of post-completion project sustainability is limited (Hutaserani & Bayley 2010, Pope et al. 2004). Most sustainability concepts are applied towards the end of a project's life to address its sustainability (Scott et al. 2018). Additionally, much of the literature on programme sustainability remains theoretical and offers little guidance for sustaining projects (Moore

et al. 2017). The literature is limited by using inconsistent definitions and measures of programme sustainability (Braithwaite et al. 2020).

Further, even though IDPs are complex, their understanding in the development field is dominated by the traditional linear model of input–output–outcome logics (Sarriot & Kouletio 2015) and use of the rational-analytic model for planning, management and evaluation (McEvoy et al. 2016). Current approaches to international development from the United States are based on rational choice theory and are state centric in their overall orientation (Scott 2008). Most sustainability approaches fall into three main groups: use of indicator checklists; use of composite indicators; and application of a framework (Peano et al. 2015). In terms of sustainability evaluation, conventional approaches tend to focus on partial dimensions and ignore interpretation of the sustainability of complex systems (Peano et al. 2015).

With respect to microfinance sustainability, a number of studies have been conducted, but few have employed complexity in their analysis. Analysis of microfinance sustainability is dominated by the institutionalist paradigm (Brau & Woller 2004; Hermes & Lensink 2011) that emphasises financial sustainability and tends not to be comprehensive (Thapa 2006). Most analysis uses financial ratios to measure performance and sustainability. Another measure is efficiency, which is concerned with the relationship between the input resources and the output produced by the inputs. The efficiency of MFIs is mostly measured using non-parametric Data Envelopment Analysis, which is defined as ‘a linear programming methodology to measure the efficiency of multiple decision-making units (DMUs) when the production process presents a structure of multiple inputs and outputs’ (Gupta 2015). Therefore, providing a more comprehensive analysis using a complex systems approach for development projects such as microfinance programmes would fill these gaps.

1.4 Research Questions

The main research question that will be addressed in this study is ‘How can a complex systems approach be used to analyse post-project sustainability (the RLF project)?’. It involves three research questions, namely:

1. How can a complex systems approach be used to evaluate project sustainability (the RLF project)?
2. How can a complex systems approach be used to understand the sustainability of a development project (the RLF project)?
3. What factors may influence the sustainability of the project (the RLF project)?

1.5 Research Objectives

In line with the research background and the research questions, the overarching aim of this research was to provide a comprehensive analysis of the post-project sustainability of a development project, specifically a microfinance (RLF) project, by using a complex systems approach. The specific aims involved the objectives to:

1. evaluate/assess the sustainability of the project
2. understand the sustainability of the project
3. explore factors that can influence the sustainability of the project.

1.6 Research Design and Methodology

This research was designed to address the research’s aim of providing a comprehensive post-project sustainability analysis of a development project—specifically a microfinance programme—after termination, by using a complex systems approach. The study is a case study that is considered as appropriate when dealing with a process and a depth complex problem (Noor 2008). A case study generates “concrete, practical, and context-dependent knowledge” of practices and real-life situations (Miles 2015). First,

this approach was used to evaluate the project's sustainability and assess whether or not it is sustainable. The project is assessed by using projects sustainability evaluation criteria developed in Chapter 3. Second, the approach was applied to understand the sustainability of the project. The interconnectedness, feedback, adaptive capacity, self-organisation, and emergence (IAFSE) is used in the analysis. Finally, factors that influenced the sustainability of the project were explored to achieve a more comprehensive analysis. Using the institutionalisation approach to project sustainability and the institutionalist view of microfinance sustainability, and considering project implementation aspects, the study aimed to explore the factors influencing the sustainability of project-based MFIs.

Selection of a methodology for research depends on the philosophical stance of the research, the phenomenon's context (Holden & Lynch 2004), the nature of the research problem (Noor 2008), the nature of the study and the research question (Crossan 2003), and practical considerations of resource efficiency and the goals of the research (Shih 1998). The current study can be categorised as an exploratory study because of its aim to achieve a deep understanding of and insights into the phenomenon of project sustainability. Kothari (2004) states that exploratory research aims to attain familiarity or new insights into a phenomenon. To permit investigation of different aspects of the problem, flexibility is vital in an exploratory study (Holliday 1964; Kothari 2004).

Considering the purpose of the study, both qualitative and quantitative case study approaches were employed. First, qualitative research was applied to evaluate/assess the sustainability of the project. Second, qualitative research was undertaken to understand the process of the project moving towards a sustainable project. Third, a quantitative study was conducted to explore the factors that might influence the sustainability of the project. The study was conducted in a microfinance (RLF) project in Central Java Province, Indonesia. This project is viable and continued to operate after its closure in 2015. This

province was selected because it had the largest assets in 2014 (when the project ended) (Ishom 2015).

Data were collected through interviews with project stakeholders, document review, site visits (observation), FGDs and a survey. Data were analysed based on the theoretical and methodological context of the research. NVivo and SPSS software was used for the data analysis. Details of the research design and methodology are presented in Figure 2.

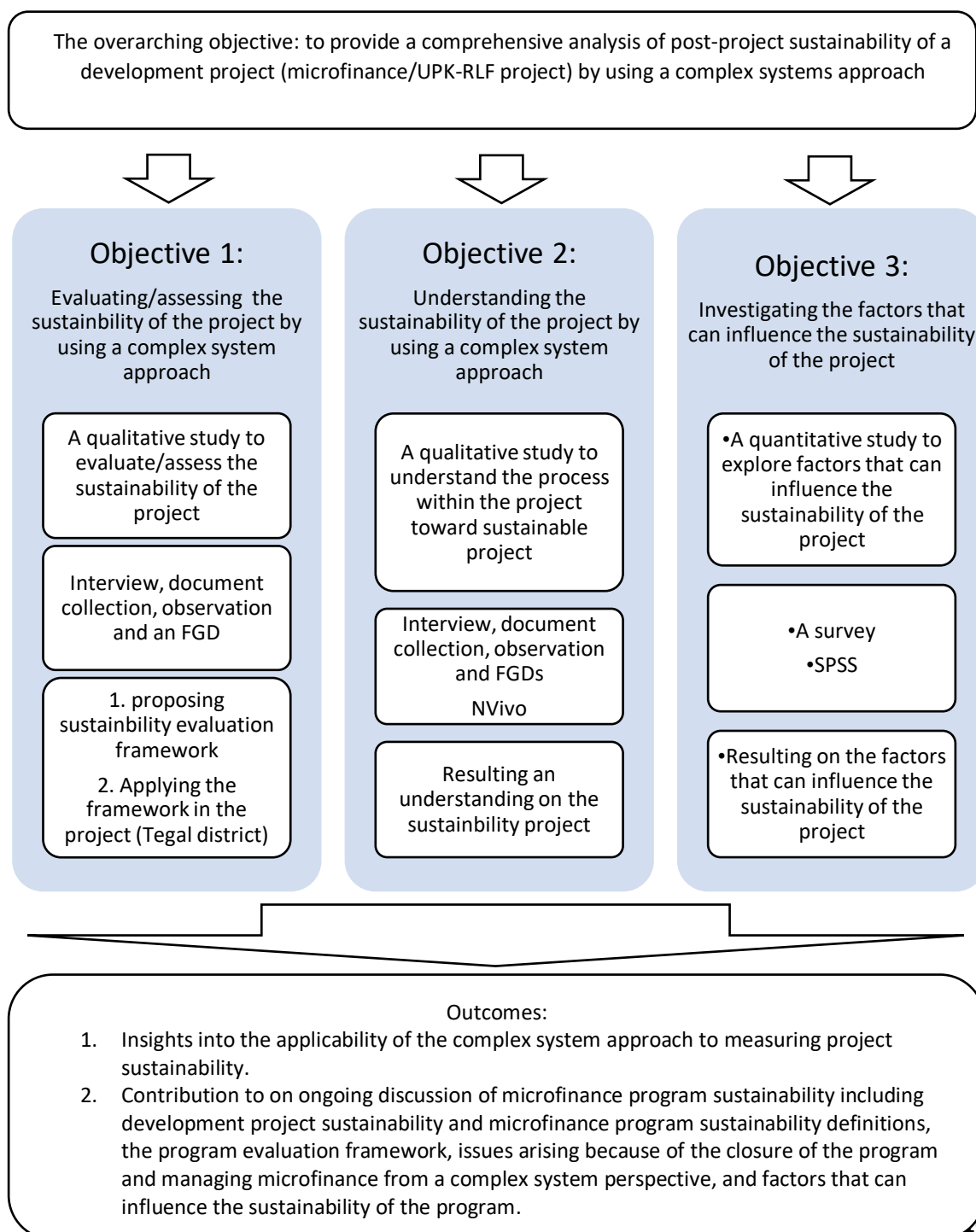


Figure 2: Research design and methodology

1.7 Significance of the Study

This study employs a complexity approach to project sustainability, which will contribute to various groups by:

1. providing empirical evidence in the research field of ex-post international development project (microfinance) sustainability
2. knowledge enhancement on development project sustainability in general and microfinance programmes in particular
3. providing important information for government and non-government organisations to carry out their future development projects, especially microfinance programmes.

1.8 Structure Of the Thesis

This thesis is presented in publication format and includes six chapters: introduction, literature review, three analytical chapters and conclusion. The analytical chapters were designed as three research articles in manuscript format covering three topics relevant to project sustainability, especially microfinance programmes (the RLF project).

Chapter 1 presents a general introduction to the thesis. It includes the background to the study, current understanding of the research topic and research gaps, research questions and objectives, research design and methodology, research contributions and the thesis structure.

Chapter 2 presents a literature review that covers IDP success/effectiveness (paper 1) and the application of a complex system approach to project sustainability.

Chapter 3 (paper 2) applies a complex system approach to post-project sustainability evaluation. A post-project sustainability framework that involves the components of

mission, input, process, output, system governance, feedback mechanism, boundary and environment is proposed. The framework is then applied to the microfinance (RLF) project.

Chapter 4 (paper 3) provides an analysis designed to understand the sustainability of microfinance (RLF) project. This includes identifying issues that arise due to the closure of a project and actions taken to cope with those issues, which include problems related to project governance, accountability, capital and profitability, competition and empowerment. The analysis also shows that the move towards a sustainable project demonstrates characteristics of a complex system, including interconnectedness, adaptive capacity, feedback, self-organisation and emergence (IAFSE).

Chapter 5 (paper 5) investigates factors that may influence the sustainability of microfinance (RLF) project. Results show that local project characteristics, community support and project management influenced the sustainability of the project.

Chapter 6 presents a summary of the thesis that includes the research findings, research outcomes, research significance, research limitation and potential for future research.

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Chapter 2: Literature Review

This chapter presents a literature review on development project success, project sustainability, and application of a complexity theory to project sustainability. Effective development projects are believed to provide positive impacts to overcome human development problems such as poverty. However successful development project implementation does not ensure the long-term benefits and impacts of the project. This might relate to the definition (criteria) of success in a development project. Focusing on short-term aspects and neglecting long-term ones in defining the success of development projects might lead to the collapse of successful project outcomes after project closure and impede the achievement of sustainable outcomes. One of the important long-term success criteria is sustainability which can provide long-term benefits of development projects. However, the sustainability of development projects is challenging. Hence, efforts to address this issue such as by using a complexity approach are crucial.

2.1 Paper 1 - International Development Project Success: A literature review

Statement Of Authorship

Title of Paper	International Development Project Success: A Literature Review
Publication Status	<input type="checkbox"/> Published <input type="checkbox"/> Accepted for Publication <input checked="" type="checkbox"/> Submitted for Publication <input type="checkbox"/> Unpublished and Unsubmitted work written in manuscript style
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Principal Author

Name of Principal Author (Candidate)	Nurchasanah
Contribution to the Paper	70% - Conducted the research, including systematic literature review (methodology design, data collection, data analysis, and theory development)

Overall percentage (%)	70%		
Certification:	This paper reports on original research I conducted during the period of my Higher Degree by Research candidature and is not subject to any obligations or contractual agreements with a third party that would constrain its inclusion in this thesis. I am the primary author of this paper.		
Signature		Date	04/04/2022

Co-Author Contributions

By signing the Statement of Authorship, each author certifies that:

- i. the candidate's stated contribution to the publication is accurate (as detailed above);
- ii. permission is granted for the candidate to include the publication in the thesis; and
- iii. the sum of all co-author contributions is equal to 100% less the candidate's stated contribution.

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Abstract

The success of international development projects (IDPs) in addressing issues associated with human development has been debated for years. This has led to discussions on key IPD success criteria and factors. This study aims to clarify the concept of IDP success and provide important insights by performing a literature review in the areas of project management and international development. The study used a PRISMA extension for scoping review (PRISMA-ScR) and thematic analysis. The study included thirty research papers pertaining to success criteria and factors across various sectors of IDPs. Results showed that the measure of IDP success includes short-term and long term-oriented criteria. Furthermore, four determinants of IDP success were identified: human factors, project characteristics, management and external environmental aspects. Additionally, insights gained from the findings resulted in reciprocal learning between the two knowledge areas and modelling of IDP success criteria and factors. Project management may gain insights into the long-term aspects of project success criteria from international development. On the other hand, international development could learn about the managerial aspects of IDPs from project management. Moreover, the contextual and interconnected aspects of IDP success criteria and factors are important in the modelling of IDP success.

Keywords: International development project, success criteria, success factors, project management, reciprocal learning insights, modelling international development project success.

2.1.1 Introduction

International development projects (IDPs) play a central role in international development (Heeks and Standforth 2014), particularly in addressing human development

issues. International development (ID) is frequently used as an umbrella term for development practice and research (Horner 2017) that aims to address significant inequalities between countries (Horner and Hulme 2017). The core concern of IDPs is poverty eradication or social transformation (Yalegama, Chileshe and Ma 2016), human quality of life improvement and well-being. The diverse and multi-faceted problems experienced by developing countries have led development studies to adopt ‘inter-disciplinary’, ‘multi-disciplinary’ or ‘cross-disciplinary’ approaches (Currie-Alder et al. 2014). Even though studies from numerous fields (for instance geography) have proved their contribution to the understanding of the development process (Harriss 2002), economics has dominated development studies compared to other disciplines (Currie-Alder et al. 2014). Specialisation leads to endogenous theory-building; however, it frequently fails to address complex societal problems (Davies, Manning and Söderlund 2018).

The humanitarian aid sector is seen as a project-oriented business which uses projects as important vehicles to deliver international development assistance (Ika, Diallo and Thuillier 2010). Organisations in the field of development change the world by managing projects (PM4NGOs 2017) that they use as instruments of choice (Ika, Diallo and Thuillier 2012). Even though an IDP cannot control development, it can trigger it (Ika and Donnelly 2017). Hence, IDP-related knowledge is multi-disciplinary, involving both international development and project management knowledge. The two disciplines share an interest in studying projects that deal with human development issues. IDPs are defined as public sector development projects or programmes that are usually financed by a donor to address the economic and social needs of developing countries (Ahsan and Gunawan 2010). IDPs can be ‘hard’ or ‘soft’ projects, small to large, implemented by an organisation's workforce or contracted, and can have a specific project timing, as in the aftermath of a natural disaster for instance (Youker 2003).

Characteristics such as project objectives, stakeholders, funding arrangements and environment explain the complexity of IDPs. First, an IDP is considered both a social and political endeavour because it aims to increase the population's wealth and its specifics are often based on political decisions (Diallo and Thuillier 2004). Therefore, project outputs and goals can be intangible (Golini, Landoni and Kalchschmidt 2018; Yalegama, Chileshe and Ma 2016), which may be seen as a deviation from traditional project characteristics. Second, stakeholders involved in IDPs are more diverse than in traditional projects. Diallo and Thuillier (2004) observed that the stakeholders of World Bank projects include the project coordinator, task manager, national supervisor, project team, steering committee, the beneficiaries and the population at large. It should also be noted that IDPs are funded by donors or agencies in the context of international cooperation, via bilateral or multilateral relations (Bayiley and Teklu 2016; Diallo and Thuillier 2004, 2005; Hermano et al. 2013; Ika and Donnelly 2017). The diverse cultures and values of the stakeholders create diverse perspectives (Landoni and Corti 2011) that make the project more complex. Furthermore, the environment of IDPs is unique and surrounded by political, social, legal, economic, cultural and geographic divisions among actors, as well as technical and organisational challenges (Hermano et al. 2013; Ika and Donnelly 2017). The lack of resources and poor infrastructure of developing countries poses additional challenges for IDPs (Landoni and Corti 2011). Hence, IDPs may face more complex issues in achieving success. These complexities may also influence the concept of IDP success.

The success of IDPs in addressing human development issues has been debated for years. The effectiveness of IDPs can be viewed from a microeconomic perspective, which relates to specific or individual project objectives, and from a macroeconomic perspective, which connects to macroeconomic indicators such as poverty reduction and economic growth (Denizer, Kaufmann and Kraay 2013; Ika 2015). The macroeconomic perspective is the domain of international development economists (Ika 2015), while the

microeconomic perspective is relevant to projects and project management (Ika, Diallo and Thuillier 2011). IDP effectiveness and the impact of projects on human development are questionable (Golini and Landoni 2014; Tabassum 2015) and debatable due to their high failure rate (Ika 2015). After forty years of development aid, a large amount of evidence shows that aid has been less effective than expected (Doucouliagos and Paldam 2009). However, empirical studies conducted by Gyimah-Brempong (2015) and Mishra and Newhouse (2009) showed that health relief has a significant impact on human development. The discrepancy between micro and macro perspectives on the effectiveness of international development has been debated: microeconomic data show encouraging results, but macroeconomic data are discouraging (Mosley 1986; Tabassum 2015).

Project success is a central concern of project management (Ika 2009). The understandings of the concept of project success are important for project managers because the concept guides performance benchmarks that help projects meet their intended performance targets. However, the definition of project success can be elusive (Baccarini 1999; Pinto and Slevin 1988) and is sometimes based on subjective perceptions (Lim and Mohamed 1999); as a result, its definition varies and is inconsistent (Davis 2016; Millhollan and Kaarst-Brown 2016). Research on project success tends to discuss success criteria and success factors (Ika 2009). Success criteria are a set of standards or principles for the assessment of success, and success factors are a set of facts, circumstances or influences that contribute to success (Lim and Mohamed 1999).

The lack of agreement on a comprehensive list of project success factors has created difficulties and caused attempts to define and evaluate success to fail (Belassi and Tukul 1996; Han et al. 2011). In contrast, grouping critical success factors and explaining their effect on project implementation leads to more effective project evaluation (Belassi and Tukul 1996). Hence, developing a measurable and meaningful construct of project success (Narainen 2017) and understanding project success factors is important for the

analysis of project success or failure (De Wit 1988). Nevertheless, it should be noted that no single definition of project success can satisfy all project stakeholders (Shokri-Ghasabeh and Kavouosi-Chabok 2009).

The debatable nature of IDP effectiveness and the complex characteristics of IDPs have called into question the success of IDPs, especially with regard to success criteria and factors. Hence, a literature review summarising the existing studies on IDP success criteria and factors is appropriate to shed light on the question. Numerous literature reviews have been conducted in the project management field, particularly on commercial project success. It is of note that, in the international development field, systematic literature reviews have examined the impact or effectiveness of humanitarian and development interventions (Mallett et al. 2012; Peters et al. 2015). However, no literature reviews specifically addressing IDP project success have been identified. Conducting a literature review on IDP success would thus fill this gap.

The primary objectives of this study are to highlight and gain insight into the concepts of IDP success by performing a review of the existing literature on project management and development. Moreover, in improving the understanding of associated concepts, the review will potentially add to the debate over IDP effectiveness. Finally, this study will also contribute to providing guidance to practitioners on how to successfully implement IDPs.

2.1.2 Methodology

This study is considered as a systematic literature review, which allows researchers to collect, analyse and integrate academic contributions in a transparent and reproducible way (Danwitz 2018). The Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) depicted in Figure 3 was used

for data collection. Furthermore, a thematic analysis method adapted from Thomas and Harden (2008) was applied for data coding and analysis.

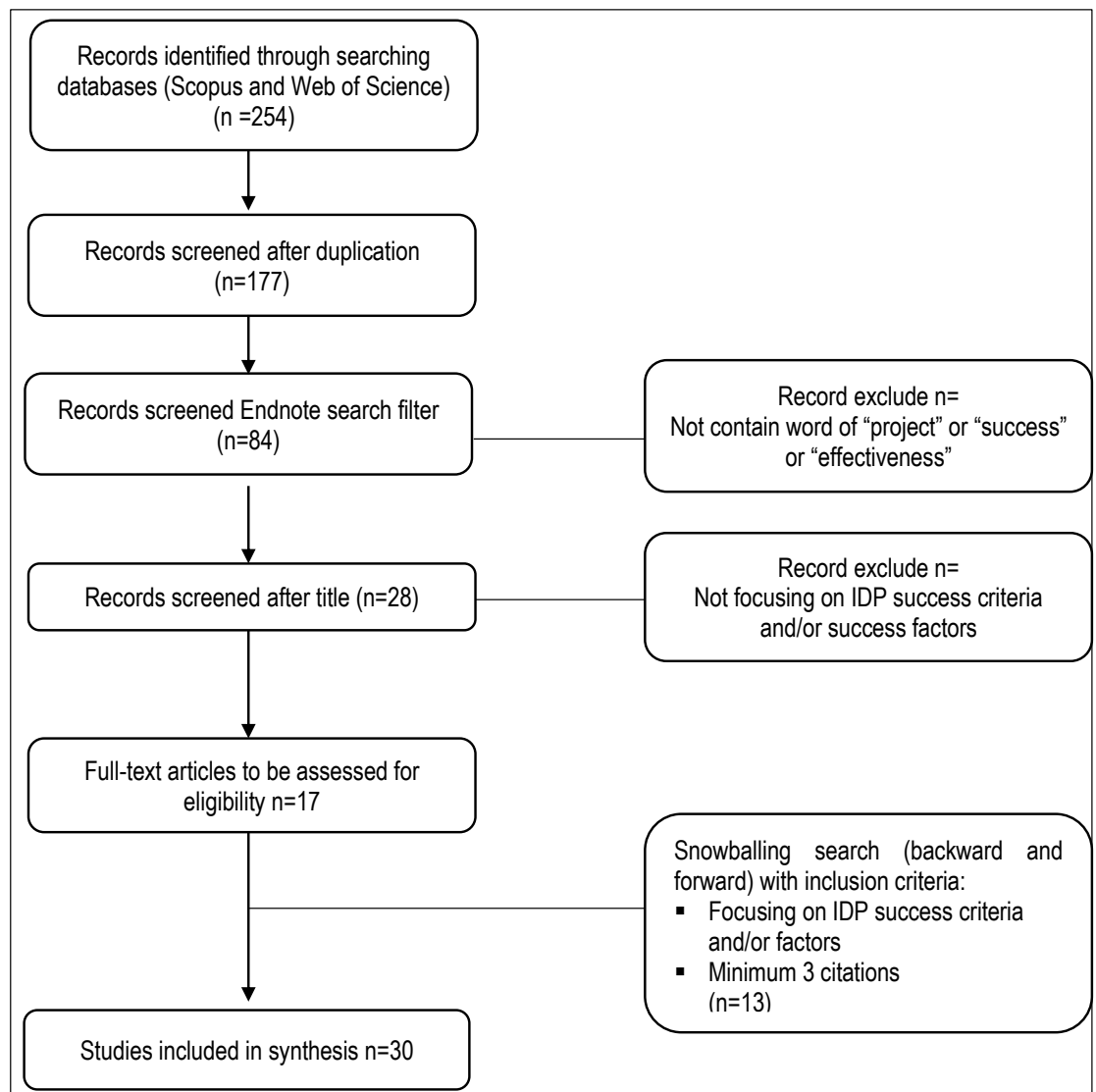


Figure 3: Study selection as adapted from PRISMA-ScR (Tricco 2018)

Traditional literature reviews can be considered to be subjective due to their significant reliance on the author's experience and knowledge (Munn et al. 2018). Scoping reviews, however, are a type of knowledge synthesis that follows a systematic approach to map evidence on the topic, identify main concepts, sources, theories and knowledge gaps (Tricco et al. 2018). Tricco et al. (2018) argue that a scoping review can be used to serve various literature study objectives. It provides a snapshot and a comprehensive

overview of what has been produced by others, including variables, methodologies and findings (Xiao and Watson 2017). The purpose of a scoping review is neither to critically appraise the quality of evidence (Arksey and O'Malley 2005) nor to assess and synthesise the results on a particular question (Munn et al.2018), but to provide an overview of existing evidence. Consequently, quality assessment is not mandatory in scoping studies (Munn et al. 2018; Peters 2015; Arksey and O'Malley 2005). The data for a scoping review can be sourced from heterogeneous disciplines, published and unpublished papers, and studies using various methodologies (Tricco et al. 2018).

Scoping reviews relying on thematic analysis have been used to identify, define and classify emerging methods for knowledge synthesis (Tricco et al. 2016). They have been also applied for a variety of purposes, such as to identify trends in guideline implementation, research the factors affecting patients' choice of healthcare providers, examine patients' experience of medical tourism and evaluate the use of social network analysis in healthcare settings (Chambers et al. 2012; Crooks et al. 2010; Gagliardi and Alhabib 2015; Victoor et al.2012). Furthermore, researchers such as Xia et al. (2018), Crampton, Reis and Shachak (2016), Martimianakis (2015) and Tricco et al. (2016) have used thematic analysis in their scoping reviews.

A scoping review is useful to answer questions such as 'what is known about the concepts?' (Tricco et al. 2018). Munn et al. (2018) provide direction (which could overlap) for conducting scoping studies: identify the types of evidence available in a certain field; clarify key definitions or concepts in the literature; identify key characteristics or factors related to a concept; and examine how a study is conducted on a certain field or topic, so as to analyse knowledge gaps as a precursor to conducting a systematic literature review. Such an approach is appropriate for the study of areas which are complex or have not been reviewed comprehensively (Arksey and O'Malley 2005), or when a field is immature and available data is limited (Petticrew and Roberts 2008).

In order to construct a narrative from available studies, a thematic approach was used for data coding and analysis. Thomas and Harden (2008) have used thematic analysis in their literature review studies. Thematic synthesis produces results that stay close to the primary studies, uses transparent synthesising methods and facilitates the production of new concepts and hypotheses (Thomas and Harden 2008). The thematic analysis applied in this study was adapted from Thomas and Harden (2008) and involved two stages: first, creating free line by line coding; second, organising these free line by line codes into related categories to establish meanings for the codes, and grouping them into meaningful descriptive constructs. Therefore, the findings of each study were combined by listing the themes describing IDP success criteria and success factors.

The review process consisted of three phases: (1) data collection; 2) coding and analysis; and (3) reporting. The data collection phase was dedicated to searching for and selecting the articles included in this study. The second phase focused on coding and analysing the data using a thematic analysis method. Lastly, the reporting phase consisted in the presentation of the study findings.

2.1.2.1 Data collection

Data collection is conducted in several steps to determine which papers must be included in the review. This involves determining search strategies and criteria for inclusion and exclusion. This study used two highly recommended academic journal databases, Scopus and Web of Science. These databases are the most extensive (Aghaei 2013), leading bibliographic databases for papers (Abdulhayoglu and Thijs 2018) and providing reliable information (Adriaanse and Rensleigh 2013). Scopus and Web of Science are considered as large and credible databases in various areas, including social science. Scopus covers a wider range of journals but is limited to recent articles (published after 1995). Web of Science covers older literature, but its coverage is limited (Falagas et

al. 2008). Hence, combining these two databases is ideal to provide more comprehensive results. Since project management in the development sector is considered to be in the developing stages, an 'all years' range search strategy was adopted, placing no limitation on the time span of the studies in order to find as many articles as possible. Additionally, only English-language articles and conference papers were included. Considering the research objective of focusing on general IDP success, various formulations were used in the topic search carried out on Web of Science and Scopus. They included 'international development project success', 'international development project effectiveness', 'aid project success' and 'aid project effectiveness'.

Only journals related to project management studies and development studies were included: *International Journal of Project Management*, *International Journal of Managing Projects in Business*, *Project Management Journal*, *Journal of Management in Engineering*, *IEEE Transactions on Engineering Management*, *Journal of Construction Engineering and Management*, *Public Administration and Development*, *Sustainability Switzerland*, *World Development*, *Development in Practice*, *Journal of International Development*, *Development Policy Review*, *Development*, *Forum for Development Studies*, *Canadian Journal of Development Studies*, *Journal of Development Economics*, *Journal of Development Effectiveness*, *Environment Development and Sustainability*, *Climate and Development*, *European Journal of Development Research*, *Development and Change*, *Foreign Aid Analyses of Efficiency Effectiveness and Donor Coordination*, and *Development Policy Review*.

The results of these database searches were exported into EndNote software; after eliminating duplicates, 177 articles were identified. Specific words such as 'project', 'success' or 'effectiveness' were then entered in the title search criteria of EndNote. This literature search turned up in eighty-four articles. The titles related to success, effectiveness or performance of international development projects were selected,

representing a total of twenty-eight articles. Based on the abstracts, seventeen articles referring to IDP success criteria and/or success factors were selected and included in the review.

All seventeen articles were read in full, including their reference lists. Furthermore, in order to complement the search, a snowballing search was conducted. As stated by Wohlin (2014), a snowballing search can be used to identify additional papers in systematic literature reviews. A backward and forward reference search was carried out by perusing the reference lists of the selected articles (backward) and entering the titles of the selected articles into the Google Scholar search engine (forward). A backward reference search aims to find additional relevant articles cited by the selected articles, whereas a forward reference search aims to look for relevant articles that cite the selected papers. Only those articles discussing IDP project success (and, in particular, success criteria and factors) with a minimum of three citations were included. This forward and backward reference search pinpointed thirteen additional articles. Thus, in total, thirty articles were selected to be reviewed. This study did not perform any further specific quality assessment or appraisal for the selection, and all thirty articles were reviewed and analysed.

2.1.2.2. Coding and analysis

This stage comprises the process of coding important information from the papers and the analysis of the information. All selected articles were studied and a charting data form using Microsoft Excel software was developed, which included the name of the author(s), year of publication, title, type of source, name of source/publisher, keywords, methodology, focus of the study, location of project and project type (sectors). Furthermore, an analysis was conducted based on year of publication, publication journal, project location and type, and was presented in the overview section.

A two-stage thematic analysis approach was applied for data coding and analysis. First, line by line coding was used on findings on success criteria and factors. Secondly, these line by line codes were organised into related areas to establish meanings for the codes and group them into meaningful descriptive constructs. Success criteria were divided into short term and long term-oriented criteria, and the success factors were organised into human factors, project characteristics, management, and external environment. The results and their discussion are presented in the following sections.

2.1.3 Results

2.1.3.1 Overview of IDP success studies

We found thirty papers which studied IDP success criteria and factors (see Appendix 3). They were published in diverse journals in the fields of project management (47%) and development (43%), indicating a fairly balanced contribution of the two knowledge areas. The studies employed various methodologies, namely quantitative, qualitative, and mixed methods. Although the number of papers published every year on IDP success has been modest and fluctuating, the trend is positive (Figure 2).

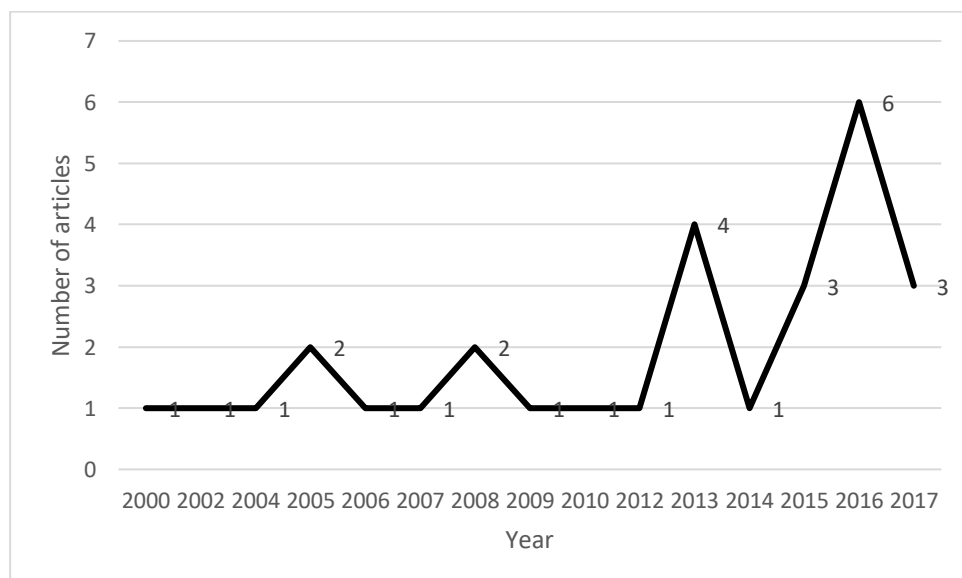


Figure 4: Number of publications per year on IDP success

Most of the studies (twenty articles, or 66%) addressed the factors contributing to the success of IDPs, with some studies (eight articles, or 27%) examining both IDP success criteria and factors. A limited number of studies (around 7%, or two articles) dealt with success criteria only (Figure 3). Thus, it appears that success factors are more topical than the debated issue of how to determine criteria to assess the success of IDPs.

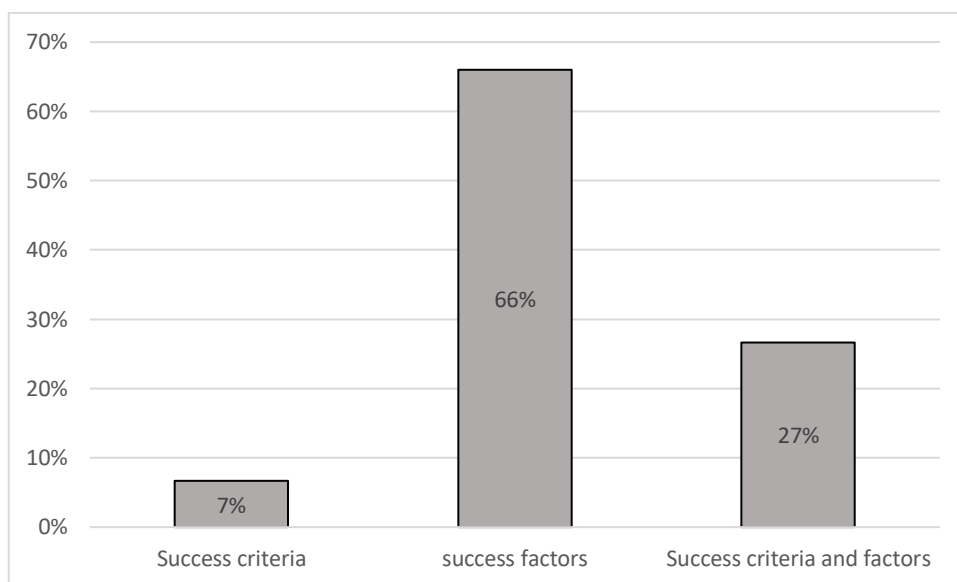


Figure 5: Research focus of the studies

The studies examined IDPs in various countries and regions. They addressed projects implemented in Africa, Asia, Europe and in mixed countries or regions. Africa and Asia were the most prominent locations, representing 37% and 30% of the studies respectively (Figure 4). Numerous sectors were considered, including community development, public financial management systems, gender equality, health and education. Additionally, most of the studies (47%) examined projects from international development agencies such as the World Bank and the Asian Development Bank.

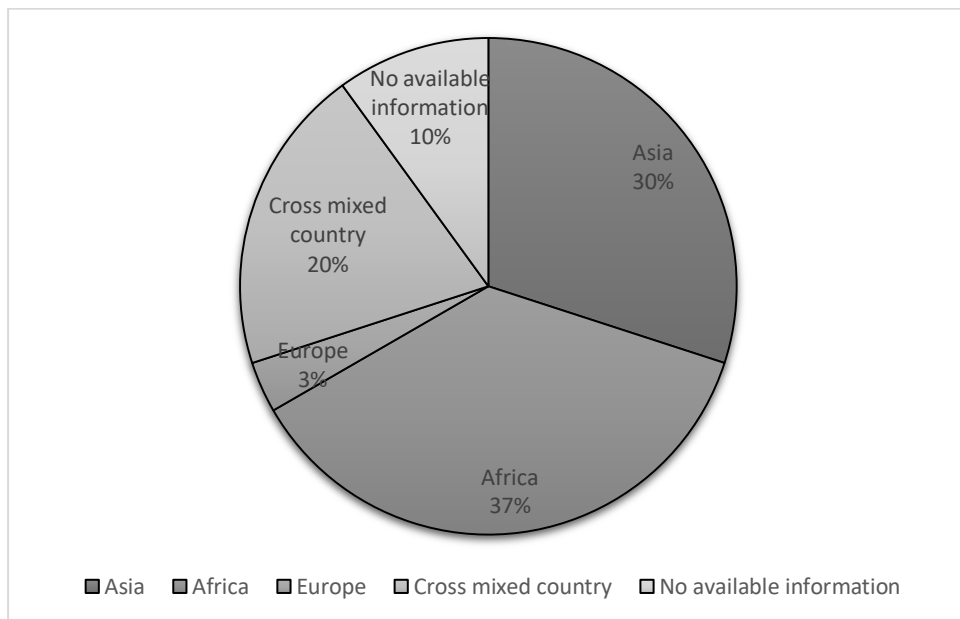


Figure 6: Research distributed by regional origin

2.1.3.2 IDP success criteria

Ten articles examined IDP success criteria from the perspectives of various stakeholders. However, most of them used the project team (project managers and team members) as the study informants. Only three studies explored IDP success criteria from a multi-stakeholder perspective. The criteria can be categorized into two groups based on the themes addressed, namely short term-oriented criteria (measuring the short-term aspects of project success) and long term-oriented criteria (measuring the long-term aspects of project success). The detailed categorization of IDP success criteria can be found in the appendix.

Table 1: International Development Project Success Criteria

Success criteria	Informant involved	References	
<i>Short term orientation</i>			
Efficiency (cost and time)	Project managers/supervisors/coordinators and team members (8), project beneficiaries (1)	Aga, Noorderhaven and Vallejo (2016); Bayiley and Teklu (2016); Diallo and Thuillier (2004); Ika (2015); Ika and Donnelly (2017); Jo and Barry (2008); Ngacho and Das (2014); Yamin and Sim (2016).	8
Effectiveness	Project managers/	Bayiley and Teklu (2016); Diallo and Thuillier (2004); Ika (2015);	5

(project objectives, quality)	supervisors/coordinators and team members (5), project beneficiaries (1)	Ika and Donnelly (2017); Yamin and Sim (2016).	
Relevance (beneficiaries, country, donor),	Project managers/supervisors/coordinators and team members (3), Project beneficiaries (1)	Bayiley and Teklu (2016); Ika (2015); Ika and Donnelly (2017); Yamin and Sim (2016).	4
Profile (produce desire outputs, extension opportunity, reputation, political influence)	Project managers/supervisors/coordinators and team members (2), project beneficiaries and general public (1)	Diallo and Thuillier (2004); Khang and Moe (2008)	2
Stakeholder satisfaction	Project managers/supervisors/coordinators and team members (2)	Aga, Noorderhaven and Vallejo (2016); Jo and Barry (2008)	2
Specific criteria of unique project (stakeholder involvement, safety, site dispute, environmental effect)	Project managers/supervisors/coordinators and team members (2), consultant and contractors (1)	Ngacho and Das (2014); Brière and Proulx (2013).	2
Long term orientation			
Impact	Project managers/supervisors/coordinators and team members (5), project beneficiaries and general public (1)	Bayiley and Teklu (2016); Ika (2015); Ika and Donnelly (2017); Khang and Moe (2008); Yamin and Sim (2016).	5
Sustainability	Project managers/supervisors/coordinators and team members (4), project beneficiaries and general public (1)	Bayiley and Teklu (2016); Ika and Donnelly (2017); Khang and Moe (2008); Yamin and Sim (2016).	4

2.1.3.2.1 Short term–oriented criteria

Most of the success criteria referred to DAC Principles for Evaluation of Development Assistance, which include efficiency, effectiveness, relevance, impact and sustainability. Furthermore, several success criteria in the studies addressed the short-term dimensions and aspects of project success, namely efficiency, effectiveness, relevance, project profile, stakeholder satisfaction and criteria specific to unique projects (which can be determined during or soon after their implementation). Time and cost/budget efficiency refers to the extent to which the project uses the least costly approach possible to achieve the desired results. Effectiveness corresponds to the extent to which the project meets its objectives. Relevance is the extent to which the project suits the priorities of the target

group, the recipient and the donor. Project profile is associated with desired outputs, extension opportunities, reputation and political influence. Stakeholder satisfaction refers to the extent to which the project meets the stakeholders' expectations. Finally, criteria specific to unique projects relate to project characteristics and particular project goals, such as stakeholder involvement, safety, site dispute, institutional capacity and environmental effects.

The results of the review indicate that the most highlighted success criteria, from the project stakeholders' point of view, are efficiency (four studies), effectiveness (five), impact (five), relevance (four) and sustainability (four). This suggests a tendency to prioritise short term-oriented success criteria. The studies revealed different results with regards to preferences and ranking of the criteria. Several studies, such as Diallo and Thuillier (2004), Ika, Diallo and Thuillier (2010), and Ngacho and Das (2014) demonstrated the importance of project management success criteria (time, cost and quality/objectives) in assessing the success of IDPs. However, Bayiley and Teklu (2016) found that efficiency was the least important criterion of IDP success. It must be noted that the results do not depict the perception of all participants and informants. Some studies, such as Aga, Noorderhaven and Vallejo (2016), Jo and Barry (2008), and Ngacho and Das (2014), did not measure the long-term criteria of project success, but merely used short-term criteria. As a result, the informants were not able to express their views on long-term success criteria.

2.1.3.2.1 Long term-oriented criteria

Other criteria namely impact and sustainability, deal with long-term dimensions and aspects of project success. Impact is defined as the positive and negative changes (planned and unplanned) produced by the project directly or indirectly. Sustainability refers to whether the benefits of the project are likely to continue after donor funding has

been withdrawn. Although Bayiley and Teklu (2016), Ika (2015), Ika and Donnelly (2017), Khang and Moe (2008), and Yamin and Sim (2016) revealed the importance of impact and sustainability, research conducted by Diallo and Thuillier (2004) and Brière and Proulx (2013) found that long-term aspects were behind the short-term aspects. This difference highlights the varying views on the priority of success criteria.

Measuring sustainability and impact during or shortly after project implementation is difficult. Therefore, the studies reviewed could not fully measure the long-term aspects of project sustainability and impact, though these were included in the research. Performance evaluation ratings published by the World Bank are conducted two years after project completion but evidence of impact and sustainability can only be found several years after project completion (Ika 2015). Some definitions of sustainability (such as that of the Evaluation Cooperation Group and Organisation of Economic Cooperation and Development – Development Assistance Committee) refer to the likelihood that project results will be provided over time (Asian Development Bank 2010).

2.1.3.3 IDP success factors

There are several types of critical success factors corresponding to different project objectives (Chua, Cog and Loh 1999), and the complex objectives of IDPs entail complex success factors. Although common factors influence project implementation, IDPs are also affected by other factors related to their unique characteristics, such as the participation of beneficiaries, political interests and macro factors of democracy and gross domestic product (GDP). Each developing country has its own historical context, economic, social, form of government and political context, laws and human capacity, which influence the success of IDPs (Currie-Alder et al. 2014). Based on the themes that emerged from the review of the selected papers, success factors can be categorised into four groups: human

factors, project characteristics, management and external environment. The detailed factors can be seen in Appendix 2.

Table 2: International Development Project Success Factors

Success factors	Reference	Success factor group
Transformational leadership, project manager's professionalism, project team members skills and motivation, intellectual capital, key manpower competency, project management skills of the project manager, project manager's cultural competence, task team leaders' characteristics/ quality, project manager personality, project team characteristics, stakeholder commitment, trained and experienced project manager, competencies of managers and team members, a clear understanding of the links between project activities and project objectives by all staff, being ready to take bold steps and make necessary strategic changes, attitude of implementing personnel, past experience of implementing actors with similar programmes, project manager' understanding of the project,	Aga, Noorderhaven and Vallejo (2016); Hassan, Bashir and Abbas (2017); Barakat, Bendou and Martin (2015); Bayiley and Teklu (2016); Brière and Proulx (2013); Dale and Dulaimi (2016); Denizer, Kaufmann and Kraay (2013); Hermano et al.(2013); Ika, Donnelly (2017); Lin Moe and Pathranarakul (2006); Jo and Barry (2008); Rahman (2009); Struyk (2007); Vickland and Nieuwenhuijs (2005).	Human characteristics
Organisational framework existence for community, project ownership, sound project case, project required by the authorities, project size, project length, resource availability, project adaptation, availability of technical experts, project compatibility with the government goal, sufficient resources and support, sufficient functional and disbursement of resources, clear targeting criteria and programme coverage, diversity of direct project beneficiaries	Barakat, Bendou and Martin (2015); Bayiley and Teklu (2016); Brière and Proulx (2013); Denizer, Kaufmann and Kraay (2013); Feeny and Vuong (2017); Wanyoike and Baker (2013); Hermano et al.(2013); Ika, Donnelly (2017); Jo and Barry (2008); Khang and Moe (2008); Lin Moe and Pathranarakul (2006); Rahman (2009)	Project
Effective stakeholder engagement, implementation approach, project design, project planning, project monitoring, project preparation and supervision, coordination and collaboration, regular progress meeting timely payment to the clients, the lessons learned during close-out meetings, holding close out meetings,	Bayiley and Teklu (2016); Hermano et al.(2013); Lin Moe and Pathranarakul (2006); Ika (2015); Ika, Diallo and Thuillier (2012); Wanyoike and Baker (2013); Yamin and Sim (2016); Jo and Barry (2008); Khan, Thornton and Frazer (2000); Yamin and Sim (2016); Ika, Diallo and Thuillier	Management

<p>project management structure, compatible development priorities, effective consultation, technical factors, effective logistics management, a full complement of operational guidelines, ensuring “partnership 36functional3636”, ensuring involvement of beneficiaries, routine reflection on project progress, strong project management, measurable project management outcomes, team building, participation, training and capacity building, achievement of outputs, project team trust, team cohesion, learning opportunities, alignment, full time project managers, creating an awareness and sense of urgency for change, 36functional36 success stories, creation of a powerful group of champions’ of change, anchoring changes in the organisations’ culture, selecting a right project team, clear understanding of project environment, managerial, corruption, effective institutional arrangement, effective information management system, effective communication mechanism, staff empowerment and a flexible approach to operations, using the best individuals from each 36functional area, top down strategy, institution development activities in projects, and trustful relationship with project beneficiaries</p>	<p>(2012); Ika, Diallo and Thuillier (2010); Kilby 2000, Kilby 2015, Denizer, Kaufmann and Kraay (2013); Feeny and Vuong (2017); Khang and Moe (2008); Kwak 2002, Rahman (2009); Vickland and Nieuwenhuijs (2005); Aga, Noorderhaven and Vallejo (2016); Barakat, Bendou and Martin (2015); Brière and Proulx (2013); Diallo and Thuillier (2005); Ika and Donnelly (2017);</p>	
<p>the quality of policies and institutions; the rate of per capita income growth/good macroeconomic policies (proxied by economic growth); state capacity; local environment; policy characteristics; institutional environment; political support ; political factor; legal factor; cultural factors; economic factor; environmental factor; social factor; supportive laws and regulations; degree of local leadership support and its consistency; institutional environment; physical factor;</p>	<p>Denizer, Kaufmann and Kraay (2013); Feeny and Vuong (2017); Hanson and Sigman (2016); Hermano et al.(2013); Ika, Diallo and Thuillier (2012); Jo and Barry (2008); Kwak (2002); Lin Moe and Pathranarakul (2006); Struyk (2007); Yamin and Sim (2016)</p>	<p>External environment</p>

2.1.3.3.1 Human factors

Human factors relate to human characteristics such as personality, competences, skills and leadership. Denizer, Kaufmann and Kraay (2013) found that team task leader

characteristics drove the project outcomes. The personality traits of project managers (agreeableness, extraversion and openness to experience) were found to be direct positive predictors of IDP success (Hassan, Bashir and Abbas 2017). The perseverance of project managers was important in helping them face challenges during the project implementation phase (Barakat, Bendou and Martin 2015). Additionally, research found that cultural competence might improve the project manager's knowledge and awareness of local factors that are crucial to the project's success (Dale and Dulaimi 2016). Other studies concluded that clear and accepted goals and the commitment of key project stakeholders also determined the success of IDPs (Lin Moe and Pathranarakul 2006). Indeed, multi-stakeholder commitment created a depth of resources working towards common results (Ika and Donnelly (2017).

Consequently, studies have been conducted to explore the role of leadership in the success of IDPs. The leadership style of IDP managers was found to play a significant part in IDP success (Aga, Noorderhaven and Vallejo 2016; Hassan Bashir and Abbas 2017). Researchers noted that project managers practising transformational leadership inspired and encouraged their team members, enhanced mutual understanding and team cohesion and developed follower self-management, which led to the success of the project (Aga, Noorderhaven and Vallejo 2016). In particular, transformational leadership explained the relation between the personality of project managers and the success of education and healthcare projects (Hassan, Bashir and Abbas 2017). Thus, human factors are important determinants of the success of IDPs.

2.1.3.3.2 Project characteristics

Factors related to project characteristics correspond to the nature of the project and elements such as project resources, size and length. Hermano et al. (2013) pointed out the need for resources, given their limited availability in all recipient countries. Notably,

sufficient resources were important in the project planning phase (Khang and Moe 2008). Furthermore, mobilisation and disbursement of resources were also found to play an important role in the success of IDPs (Lin Moe and Pathranarakul 2006). Other studies highlighted the importance of the availability of technical experts, given that skilled experts are in short supply in recipient countries (Jo and Barry 2008). Additionally, projects that were requested by the authorities and aligned with the government's goals were likely to be successful (Brière and Proulx 2013; Jo and Barry 2008).

Studies on project size showed heterogeneous results. Denizer, Kaufmann and Kraay (2013) found a significant negative effect of project size on project performance. However, studies conducted by Wanyoike and Baker (2013) and Feeny and Vuong (2017) identified a positive relation instead. Similarly, studies on project length produced diverse results. Although Denizer, Kaufmann and Kraay (2013) reported a negative relation between project length and project outcomes, Feeny and Vuong 2017 found no evidence of an effect of project length on the probability of success. Moreover, Ika (2015) documented a non-significant influence of project characteristics (size, length and experience) on the World bank project supervision's critical success factors. The diversity of study results indicates that other factors may also influence the success of the projects.

2.1.3.3.3 Management factors

Managerial factors refer to project management and to general concepts of management and organisation. Several studies have highlighted the importance of project design and planning, approaches to implementation, stakeholder engagement, supervision and monitoring. Ika (2015), and Ika, Diallo and Thuillier (2012) observed a significant effect of project design on the success of World Bank projects. Moreover, Jo and Barry (2008) and Khan, Thornton and Frazer (2000) revealed the importance of project planning. Nonetheless, studies conducted by Ika, Diallo and Thuillier (2010) and Yamin and Sim

(2016) reported a non-significant effect of the level of planning and project design on IDP success. Researchers also found that multi-dimensional approaches to implementation and ‘what if’ scenarios applied to IDPs contributed to their success (Hermano et al. 2013; Khan, Thornton and Frazer 2000). Because IDPs are complex and involve many stakeholders, effective stakeholder engagement is required (Bayiley and Teklu 2016; Hermano et al. 2013; Lin Moe and Pathranarakul 2006). Additionally, studies showed that involving the community in project implementation appeared to foster project success (Yalegama, Chileshe and Ma 2016).

Project preparation, supervision and monitoring are also important factors in the success of IDPs. Kilby (2005) found that the longer preparation period of World Bank projects was likely to improve the project performance. Ika (2015) and Kilby (2000) also noticed a significant positive relationship between the supervision of World Bank projects and their success. However, Denizer, Kaufmann and Kraay (2013) documented a statistically significant negative partial correlation between project preparation and supervision expenditures and project outcomes. Ika (2015) noticed that supervision only affected the success of project management and might not influence the impact of the project. Additionally, project monitoring was shown to have a significant positive influence on IDP success (Ika 2015; Ika, Diallo and Thuillier 2012; Yamin and Sim 2016). Indeed, researchers observed that the use of project monitoring and evaluation tools contributed significantly to the success of IDP implementation (Ika, Diallo and Thuillier 2010).

Furthermore, the organisational climate in which a project is implemented evidently influences project outcomes (Gray 2001). In IDPs, factors related to team building, training and capacity building, coordination, collaboration and participation were highlighted by the studies. Significant positive relationships between team building and project success were identified by the literature (Aga, Noorderhaven and Vallejo 2016;

Hassan, Bashir and Abbas 2017). Indeed, researchers found that team building can increase the knowledge of team members about their own roles and responsibilities and the project goals as well as enhance their communication and problem-solving skills, thus influencing the success of IDPs (Aga, Noorderhaven and Vallejo 2016). A qualitative study on the effect of training on project performance conducted by Brière and Proulx (2013) and confirmed by Ika (2015), Ika, Diallo and Thuiller (2012) and Yamin and Sim (2016) found a significant positive relationship between training and project performance. Additionally, Vickland and Nieuwenhuijs (2005) revealed that extensive training was important to ensure client readiness and the sustainability of the project.

Studies on project coordination uncovered a positive relationship between coordination and the success of IDPs (Ika 2015; Ika, Diallo and Thuillier 2012; Yamin and Sim 2016). This result is not surprising since project coordinators play a crucial role in the implementation of IDPs (Yamin and Sim 2016). Moreover, collaboration was found to be important for the success of IDPs, as studies concluded that success could be achieved by creating synergies in project implementation between diverse high-functioning teams of stakeholders in order to reach project goals (Ika and Donnelly 2017). According to the existing research, coordination and collaboration in IDPs should be realised at five levels for IDPs to be successful, namely the project, organisational, regional, national and international levels (Lin Moe and Pathranarakul 2006).

2.1.3.3.4 External environment

The external environment encompasses country-level characteristics and other related factors such as the economy, politics, society and culture. Denizer, Kaufmann and Kraay (2013) and Feeny and Vuong (2017) found a positive influence of GDP on the success of IDPs. Researchers suggested that economic policies matter for IDP performance, and that projects implemented in more developed countries are likely to have

a higher chance of success (Feeny and Vuong 2017). Studies produced different results regarding the influence of democracy as measured by the Freedom House Score (FHS). Denizer, Kaufmann and Kraay (2013) reported a positive relationship between FHS and IDP outcomes, whereas Feeny and Vuong (2017) documented a significant negative relationship. However, Hanson and Sigman (2016) revealed that IDPs are most likely to succeed where state capacity is relatively high, regardless of the level of democracy.

Indeed, research has shown that the success of IDPs is influenced by the socio-political and cultural environments in which the projects are implemented (Hermano et al. 2013; Jo and Barry 2008; Kwak 2002; Lin Moe and Pathranarakul 2006; Struyk 2007). A well-devised project is necessary to achieve policy goals and gain strong support from the authorities (Hermano et al. 2013; Jo and Barry 2008; Lin Moe and Pathranarakul 2006; Struyk (2007). However, excessive political interventions such as the integration of political considerations into project management processes create conflicts of interests that may lead to project failure (Barakat, Bendou and Martin 2015). In addition, corruption was found to significantly affect the success of IDPs (Kwak 2002; Struyk 2007). Cultural environments, which comprise customs, religions, values and the resistance of the community to new social values, have also been found to impact IDP success (Kwak 2002). Context indeed plays a significant role in IDP success and could explain why an IDP that has proven successful in a particular place can fail when it is replicated elsewhere (Ika and Donnelly 2017).

2.1.4 Discussion

2.1.4.1 Reciprocal learnings for project management and international development

Project management and international development research are neighbouring disciplines which share an interest in the study of projects dealing with human development issues. Yet, the successful integration of neighbouring disciplines can be

hindered by ‘encapsulation’, which refers to the narrow assimilation of shared ideas or concepts from other disciplines in line with self-referential ideologies (excluding other relevant perspectives and interpretations) that tend towards self-containment rather than cross-fertilisation (Davies, Manning and Söderlund 2018). Patterns of discipline fragmentation and self-containment have been accused of leading to failures to address complex phenomena. The findings of this literature review may indicate that the two disciplines examined engage in self-containment, as described below.

First, with respect to the field of project management, the findings show that the success of IDPs is judged according to criteria oriented towards short-term success (efficiency, effectiveness, relevance, project profile, stakeholder satisfaction and criteria specific to unique projects) and towards long-term success (notably impact and sustainability). However, time and budget efficiency were still found to be the dominant criterion in the literature. This is in line with the suggested project management standards for IDPs (such as PMBOK, PMD Pro and PM4DEV), which have not paid sufficient attention to the long-term aspects of IDP success, in particular in their definition of project success. These standards focus more on scope, timelines, budget compliance, quality (PM4DEV 2015; PM4NGOs 2017) and satisfaction (Project management Institute 2017). Project management for IDPs appeared to lean towards the triple constraints used in traditional project success definitions. This could imply that project management tends towards self-containment by emphasising short term-oriented success criteria.

This trend is understandable, since cost and time overruns remain significant problems, especially for infrastructure projects in developing countries such as Jordan, Kenya, Egypt and Afghanistan (Al-Hazim, Salem and Ahmad 2017; Kagiri and Wainaina 2017; Aziz and Abdel-Hakam 2016; Niazi and Painting 2017). Nonetheless, it fails to address the long-term and complex aspects which are pivotal in the context of IDPs. The fact that poverty reduction and economic growth are commonly used as macroeconomic

indicators of IDP success clearly shows the importance of the long-term effectiveness (sustainable impact) of IPDs. When the understanding of project success is limited to time, cost and scope, project management is perceived as providing no strategic value (Jugdev and Müller 2005). Focusing on short-term aspects and neglecting long-term ones would lead to the collapse of successful project outcomes after project closure.

As with public projects, the definition of success criteria should refer to public interests and interests accepted by the development community. For example, the concept of efficiency in public projects measures the net contribution of the projects to overall social welfare (Brzozowska 2007). IDP professionals should balance the satisfaction of client-donor interests and respect for local populations (Brière et al. 2015). IDPs are inherently characterised by a common goal of contributing to poverty reduction or economic growth; hence, most are not-for-profit projects (Ika 2012). Although macroeconomic views on aid effectiveness raise issues (Mosley 1986; White 1992), the weak links between aid projects and development objectives may explain the insignificant positive impact of aid projects on development outcomes such as growth (Bourguignon and Sundberg 2007). Indeed, relying mainly on project management success (efficiency/cost and effectiveness/objectives) may not bolster the project's impact (Ika 2015), but rather impede the achievement of sustainable outcomes for human development.

Second, the review showed that the discipline of international development also appears to be self-contained. Studies published in development journals use macro-level factors such as quality of policies, GDP, democracy and state capacity as determinants of IDP success. On the other hand, managerial aspects, especially those which are problematic in IDPs and cause project failure (Ika and Donnelly 2017), have been largely ignored by international development economists (Ika 2015). Because of this lack of attention, there is currently no explanation for how actual inputs are transformed into

outputs, as pointed out by Ika (2015). Even though elements such as supervision and human quality are examined in development research, it seems that, by ignoring the managerial aspects of IDPs, international development is prone to self-containment.

Management processes are important parts of IDPs. As the results of this review have shown, numerous elements fall under the category of managerial factors. Denizer, Kaufmann and Kraay (2013) found that country-level macro variables explain 20% of the total variation of IDP outcomes at most and that the remaining outcome variations are accounted for by project-level characteristics. Furthermore, the managerial aspects of IDPs may be useful in opening the ‘black box’ of the input-output process of IDPs (Ika 2015). Indeed, some researchers argue that managerial features may contribute to explaining the complex causality chain linking aid flows to development outcomes (Bourguignon and Sundberg 2007). Opening the black box of IDP management would thus improve the understanding of project performance (Ika 2015), which may help identify ways to bolster project effectiveness. Golini, Kalchschmidt and Landoni (2015) uncovered a relationship between the adoption maturity level of project management tools and the success of IDPs. Besides, tailoring project management approaches by providing more flexibility while maintaining structure is important in IDPs (Steinfort and Walker 2007). Hence, the existing literature shows that learning more about the managerial aspects of IDPs might improve the performance of projects in reducing poverty and solving human development issues. It may thus contribute to explaining macro-view gaps in IDP effectiveness.

2.1.4.2 Modelling International Development Project Success Criteria and Factors

As revealed in the findings, the success criteria of an IDP are comprehensive and beyond the triple constraints of traditional project success criteria. Traditionally, project success was perceived as the meeting of budget, time, and performance goals (Shenhar et al 2001). However, IDP project success criteria involve both short term dimensions of

efficiency, effectiveness, relevance, profile, stakeholder satisfaction and specific criteria of unique projects and the long-term dimensions of impact and sustainability. These criteria align with the DAC Principles for Evaluation of Development Assistance of measuring IDP success that include efficiency, effectiveness, relevance, impact, and sustainability. Furthermore, long term aspects such as impact is particularly important in IDPs since that is what is expected by the development community (Diallo & Thuillier 2004). Moreover, sustainable projects determine the long-term benefits of these projects (Chuanmin, Bing & Lu 2012). Figure 5 presents a model for thinking about IDP success criteria.

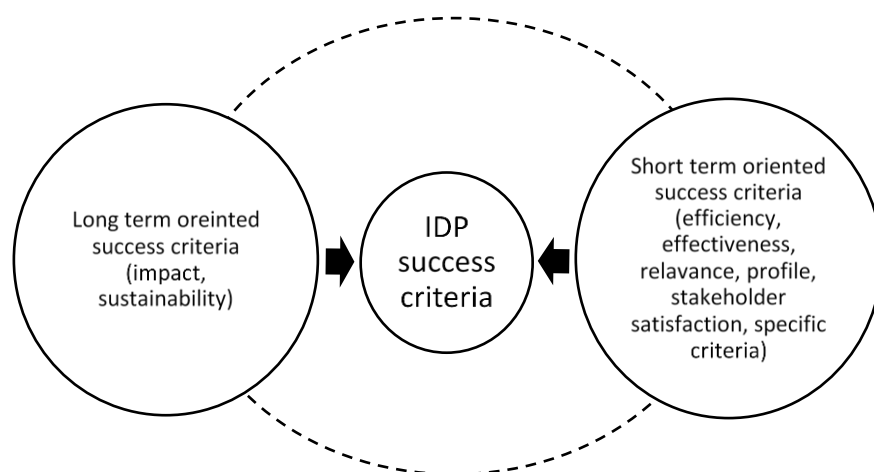


Figure 7: Model of IDP Success Criteria

The distinction from traditional project success criteria represents the complex characteristics of IDPs which involve various stakeholders and having long term goals. Furthermore, the detailed success criteria of each IDP could be different from others relying on the project stakeholders' agreement. The success criteria fulfil the requirements of delivering high quality products/services which can satisfy the needs of community, achieve the government targets/goals, meet a favourable result for international agencies and donors and provide a sustainable positive impact. They would represent the demands

and expectations of diverse constituent groups associated with nonprofits. Therefore, agreement among the project stakeholders which represent contextuality influences the criteria. However, as public projects, the definition of success criteria shall refer to public interests accepted by the development community or public interests. Additionally, those criteria are not dichotomous, they could be interconnected (it might be relations among the criteria). For instance, it would be possible that efficiency resulted by a project relates to the profile (reputation) of the project.

There are different sorts of critical success factors for different project objectives (Chua, Cog & Loh 1999) and the complex objectives of IDPs lead to complex success factors. Success would be determined by these more complex factors. A representation is shown in Figure 6. It is distinguished by human (stakeholders) involved in the project, project characteristics, managing the projects and external environment where the project is implemented. Specific determinants such as beneficiaries' participation, political interest and macro factors of democracy and GDP could differentiate from the success factors of traditional projects. The performance of international traditional projects such as joint venture projects was not significantly influenced by country related risks (Ozorhon et al 2007). Moreover, each developing country has its own context of histories, economic specialisation, government form and political context, laws, and human capacity that influences the success of IDPs (Currie-Alder et al. 2014).

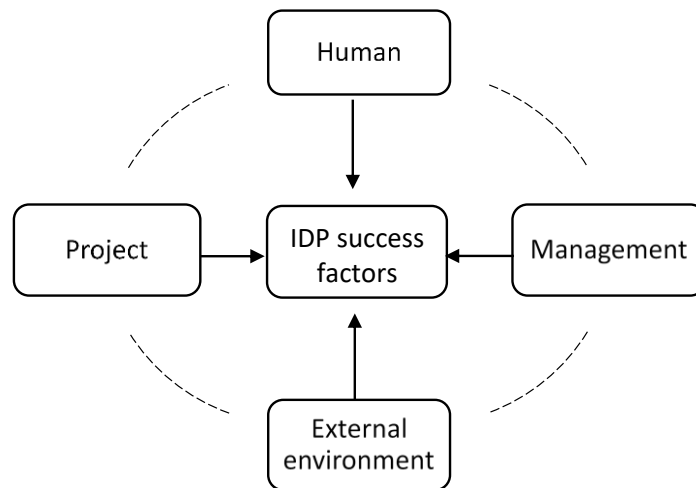


Figure 8: Model of IDP Success Factors

The model implies that those success factors are contextual and interconnected. Contextual means the detail influencing factor items are influenced by the environment where the project implemented. As suggested by Ika & Donnelly (2017) context matters in IDPs. Hence, a project might have different success factors from other similar projects depending on local environment. Furthermore, interconnection implies the possible connection among the success factors. For example, the political support offered by the government (external environment factor) might be related to project alignment to the government goals (project related factor). The local social-economic circumstances (external environment factor) might influence the approach taken to manage the project (management factors).

2.1.4.3 Future research, implications and study limitations

This review suggests the need for additional research. Future studies should seek further empirical evidence of commonalities in IDP success. Investigating the effect of the success criteria promoted by project management standards on the success of IDPs would also be important. Conducting studies on the effects of the short- and long-term criteria used by project stakeholders on the successful achievement of projects is also imperative.

Additionally, massive studies on the sustainability and impact of IDPs years after their completion is important to inform projects effectiveness and future successful projects. In line with the complex characteristics of IDPs, employing complex perspectives on IDPs in future research will be crucial.

Research should also be conducted on a broader range of IDPs from various development project implementers and agencies. In addition, since many important stakeholders are involved in IDPs, future studies should investigate the success of IDPs from multi-stakeholder perspectives. Further systematic reviews that include in-depth analysis such as measuring the ‘weight’ of evidence and assessing the limitation and benefits of the studies will also be important. Testing the IDP success criteria and success factors through empirical research is essential to generalise the findings. Finally, explanations for the micro–macro paradox of IDP effectiveness could be explored through investigations into the gaps in project success orientation between the short-term approach of project management and the long-term impact view of development.

This literature review has implications for both knowledge and practice. It showed that addressing complex human development issues requires multi-disciplinary and specific approaches. The self-containment of knowledge within separate disciplines and the lack of mutual acknowledgement may lead to the failure of efforts to address these complex issues. Moreover, the assumption that a universal theory can be applied to all contexts in a ‘one-size-fits-all’ approach is problematic. On a practical level, IDP managers should be aware of the long-term success criteria of impact and sustainability, which are the accepted criteria in development communities and represent public interests. They should also be aware of the complex characteristics of IDPs and pay attention to managerial factors, the diversity of stakeholders and the local environments of the projects. Finally, they should tailor flexible approaches for managing IDPs.

Some limitations to this systematic literature review must be noted. The review was constrained by the search strategy relying on keywords, journal and database selection and criteria selection. As IDPs are multi-disciplinary in nature, it would be important to broaden the scope of the study. It must also be acknowledged that the use of only two databases and the three citations benchmark may have limited the number of the selected articles. Furthermore, placing the focus on international development projects in general may have resulted in a review that captures limited research on individual or specific types of projects. In addition, this review employed a scoping approach that did not include deep and specific quality assessments. The thematic analysis used may also be subjective, relying on individual insights and judgements. However, as an overview of current thinking on IDP project success, this review provides a way forward for future research and improvement of practice.

2.1.5 Conclusion

This study set out to clarify the concept of IDP success and gain insights by performing a systematic literature review within the fields of project management and international development. The review examined thirty papers dealing with success factors and criteria. Two groups of success criteria were identified (short term-oriented and long term-oriented criteria) as well as four groups of success factors (human factors, project characteristics, management and external environment). Additionally, reciprocal learning in the knowledge area of project success is encouraged for greater project effectiveness. Project management may gain insights into the long-term aspects of project success criteria from international development. On the other hand, international development could learn about the managerial aspects of IDPs from project management. Moreover, the contextual and interconnected aspects of IDP success criteria and factors are important in IDP success. Finally, dealing with complex problems in IDPs requires multi-disciplinary and

flexible approaches. Although partnership among disciplines will be not be easy in practice, complex and multi-faceted empirical realities unequivocally call for collaboration. Therefore, complementary endeavours are needed to improve the performance of IDPs.

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2.2 Applying Complexity Theory to Project Sustainability

2.2.1 Project Sustainability

Sustainability has been defined from different perspectives with reference to the Brundtland Commission of the United Nations in 1987 that sustainability is ‘development that meets the needs of the present without compromising the ability of future generations to meet their own needs’. In the context of development projects, the term is associated with ‘continuation’, ‘durability’, ‘continuance’, ‘maintenance’, ‘long term’, ‘adherence’, ‘institutionalisation’, ‘routinisation’, ‘adoption’, ‘embedding’, ‘appropriation’ ‘incorporation’ and ‘integration’ (Walugembe et al. 2019). It involves the three interconnected dimensions of social, environmental and economic aspects (Spangenberg 2014) with the real challenge being the societal aspect (Leeuw 2018). Choi and Jang (2020) define sustainability as the ability to exist constantly. From a system perspective, sustainability refers to the ability of a system to persist, transform or transition, and adapt when facing constantly changing conditions (Williams et al. 2017). Further, the sustainability of a project is commonly defined in terms of what happens after the implementation phase (Stirman et al. 2012). It can relate to continued programme activities, benefits, capacity building, further development (adaptation) and recovery of costs (Lennox et al. 2018). However, there is no single definition of programme/project sustainability, which might be because what is to be sustained differs between programmes (Palinkas et al. 2020). Therefore, clearer definitions informed by the literature on sustainability are crucial for sustainability research development (Stirman 2012).

Sustainability of development projects/programmes/interventions is crucial because implementing interventions, which often require a lot of resources, may be meaningless without long-term success (Chamber et al. 2013). A sustainable health programme can maintain the intended benefits and community capacity, and should optimise resources and investment (Bodkin & Hakimi 2020). Further, programme

sustainability is important for studying the implementation of interventions because, first, long-term effects of sustained programmes are easier to study; second, changes are difficult to identify until 3–10 years after the beginning of the intervention; and third, investments are lost if an intervention is not sustainable (Walugembe et al. 2019).

2.2.2 Complexity Theory

Proponents of complexity theory view it as ‘a mean of simplifying seemingly complex systems’ (Manson 2001). Complexity theory or complexity science has basic principles that consist of nonlinear dynamics, adaptation/evolution and chaos theory, and other principles of self-organisation, emergence, feedback and chaos (Turner & Baker 2019). Manson (2001) divides complexity research into three major divisions: algorithmic (information theory and mathematical complexity theory), deterministic (catastrophe theory and chaos theory) and aggregate complexity (how individual elements work together to create systems with complex behaviour). Complexity theory and system theory are both holistic appreciations of system interconnectedness and anti-reductionism (Manson 2001).

Complexity may be used to study complex systems (Kallemeyn et al. 2020; Turner & Baker 2019) and sees systems as nonlinear, unpredictable and open (Turner & Baker 2019). Complexity theory has been used as a theoretical/conceptual framework and as complexity–congruent methodologies and methods (Kallemeyn et al. 2020). A theoretical/conceptual framework based on complexity theory may involve concepts and assumptions about chaotic, dynamic and embedded systems, nonlinear changes may result in no, multiple or unanticipated effects, inputs to a system are disproportionate to outputs, and a small change may lead to a large impact or vice versa, and be unpredictable. The use of complexity–congruent methodologies and methods involves but is not limited to system dynamics modelling, agent-based modelling, social network analysis and case-based

approaches. Complexity theory pays attention to the interactions among health system elements and how they lead to spontaneous organisation and the emergence of new relationship structures (Gear et al. 2018). Moreover, complexity theory can be used to view interactions between elements within a project as a socio-technical system (Ferreira & Saurin 2019). This can help understand, gauge and manage the complexity of a development project (Nigra 2017).

2.2.3 Application of Complexity Theory to Project Sustainability

The questionable long-term effectiveness of development projects has led to development of various approaches to project sustainability. Findings from programme evaluation and research suggest that sustainability should be studied as a dynamic and distinct phenomenon (Stirman 2012). Sustainability might be underpinned by interconnectedness, constant change, dynamic interaction, adaptation and co-evolution (Peter & Swilling 2014), which are recognised in complexity theory. Therefore, a wicked problem such as sustainability may be better addressed using complexity theory and complexity thinking methodologies (Turner & Baker 2019). A more dynamic approach to sustainability is required to better describe complexity and change within the system and context (Chambers et al. 2013). Innovative methods and approaches that can consider and represent interactions between many system elements are essential to analyse the sustainability of social-ecological systems (Gain et al. 2020). Further, uncertainty (related to the extent of intervention, evolution and adaptation) is necessary to address the needs of communities that differ from those for which interventions were originally implemented or tested (Shelton et al. 2018).

Valuable contributions of a complex system approach to sustainability include explaining the fundamental concepts of co-evolution, self-organisation, emergence and organisational viability, and their influence on sustainability (Espinosa & Porter 2011). A

sustainability transition inherently employs socio-technical change; hence, applying complexity provides a compatible analytical framework (Mercure et al. 2016). Application of complexity theory to project sustainability may contribute new insights into project sustainability conceptualisation and measurement to bridge gaps in conventional methodologies (Scott et al. 2018). Application of system thinking can strengthen the sustainability of a project (Sarriot et al. 2014).

Complexity theory can be used as an epistemological approach to sustainability definition and assessment methods (Nigra 2017). Complexity or complex systems theory is on way to assess the sustainability of health care interventions (Lennox et al. 2018). It views sustainability as a nonlinear process where change, uncertainty and adaptation are expected. Dezhn et al. (2016) defines public rental housing (PRH) project sustainability as a complex ecosystem and proposes an analytic network process (ANP)-based assessment model for PRH projects. Scott et al. (2018) provides a definition for a sustainable collaborative project network (CPN) and how to measure it using a complexity thinking lens.

Complexity theory can also be used to understand phenomena related to project sustainability. Sustainability from a system thinking view can be understood through core theoretical concepts including IAFSE (Williams et al. 2017). Sustained projects are influenced by numerous factors and how they interact; hence, studying fidelity and adaptation in project sustainability research is important (Stirman et al. 2012). Adding uncertainty that involves adaptation and evolution is necessary to address different populations' needs after project closure (Shelton et al. 2018). Further, Gear et al. (2018) applies complexity theory in qualitative research exploring sustainable health care behaviours. McKay et al. (2018) applies an agent-based modelling approach to study the dynamic influences of human resource project sustainability and population outcomes. Based on the tenets of sustainability and systems thinking, González et al. (2016) develops

a conceptual model to understand the interrelationships among the main factors that influence the sustainability and community acceptance of renewable energy system (RES) projects. Choi and Jung (2020) draw a causal map of Korean Official Development Assistance project sustainability by using system dynamics.

2.2.4 Conclusion

There is no consensus on IDP sustainability definition, but the most common definition is the continuation of a project after it is terminated (when no more funding is provided by donors to finance the project). Complexity theory views a project as a system that is nonlinear, unpredictable and open. Complexity theory has been used in project sustainability to define sustainability, as a method to assess/evaluate project sustainability, and to understand sustainability phenomena.

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Chapter 3: Paper 2 - Complex System Approach to Post-Project Sustainability Evaluation of International Development Project: A Case Study of Revolving Loan Fund (Microfinance) Project

This chapter (Paper 2) presents the first part of the analysis in this thesis, namely evaluating the sustainability of a development project. It provides a definition of project sustainability from a complex system perspective; proposes a framework to evaluate the sustainability of a development project; applies the framework in a case study; and discusses the implications of the research for project sustainability and microfinance.

Statement of Authorship

Title of Paper	Complex System Approach to Post-Project Sustainability Evaluation of International Development Project: A Case Study of Revolving Loan Fund (Microfinance) Project
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Contribution to the Paper	70% - Conducted the research, including literature review and theoretical framework, methodology design, data collection, data analysis, and theory development		
Overall percentage (%)	70%		
Certification:	This paper reports on original research I conducted during the period of my Higher Degree by Research candidature and is not subject to any obligations or contractual agreements with a third party that would constrain its inclusion in this thesis. I am the primary author of this paper.		
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- ii. permission is granted for the candidate to include the publication in the thesis; and
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Abstract

This study developed and applied a framework to assess the sustainability of a development project after the project implementation by using a complex system approach. Interviews, observation, document review and an FGD were conducted, and a thematic analysis was undertaken. A framework that involves the components of mission, input, process, output, system governance, feedback mechanism and environment is proposed. Application of the framework to a microfinance project showed that a complex system approach is applicable for post-project sustainability evaluation. The project is considered sustainable as it performs financially and socially. The study has implications for project sustainability and microfinance. First, the framework provides comprehensive information about the sustainability of a project, including help to assess project sustainability dimensions and routinisation; the possibility of detecting ineffective or undesirable practices; information on how a project is governed after its implementation and project performance; and the persistence practice and changes that have occurred during the project. Second, a microfinance programme can be sustainable without subsidies and can achieve financial and social goals.

Keywords: post-project sustainability evaluation, international development projects, a complex system approach, microfinance

3.1 Introduction

The sustainability of interventions is crucial to address, as lack of sustainability is a persistent problem in the health and service delivery sectors (Shelton et al. 2018). Further, evaluations and studies of the post-implementation phase of development projects are limited. More than 90% of IDPs are unevaluated after they close out (Cekan 2016). Most sustainability assessment is conducted before or during project implementation

(Lennox et al. 2018). Although project sustainability assessment can be conducted at many stages during the project cycle, including during project identification, preparation, approval, project implementation and post-project completion (ADB 2010a), a project's sustainability can only be determined after assistance ends (Stockmann 1997). International development agencies have paid little attention to post-project sustainability (Bamberger 2019). They sometimes pay much attention to project approval and implementation, and have less of a focus on operation, maintenance, and sustainability of project outputs and outcomes (Hutaserani & Bayley 2010; Myers et al. 2014).

Numerous studies also have been conducted to examine initial implementation efforts, but few have investigated what happens after project closure (ADB 2010a; Stirman et al. 2012). Project sustainability has been identified as an understudied area (Braithwaite et al. 2020; Shelton et al. 2018) and one of the most significant translational research problems (Shelton et al. 2018). Hence, modifications of interventions post-implementation are not fully understood or evaluated (Stirman et al. 2019).

The continuation of development projects after their completion is considered to provide sustainable impact through providing benefits at the same or a higher level as achieved during implementation (Stirman et al. 2012). It is not possible to claim a lasting impact on rural poverty alleviation without ensuring sustainability aspect (IFAD 2009). A sustainable project delivers long-term benefits to reduce poverty and provides the foundations for sustainable economic development (Chuanmin et al. 2012; Kankhva et al. 2016). It is also essential to provide evidence of the long-term benefits of projects in terms of accountability of the resources used; provide lessons learned for future projects; and support evidence-based policymaking.

While sustainability presents complexity relating to financial, social and environmental issues, it is often viewed from certain perspectives such as economic and financial viability criteria (ADB 2010b), and less attention is paid to the whole approach

of a project. A linear planning model has dominated the development field through a traditional and linear input–output–outcome logic, resulting from the logical framework model (Sarriot & Kouletio 2015). Most sustainability approaches focus on assessing resources, effectiveness (project outcomes or impact) and monitoring ability (Lennox et al. 2018). Undue project complexity is often suggested as a reason for unsatisfactory project outcomes (Denizer et al. 2013). Therefore, the complex characteristics of development intervention and repeated failures when aiming for sustainable development achievement have raised the need for a complex and nonlinear model of interventions (Sarriot & Kouletio 2015) and their sustainability (Stirman et al. 2012). Holistic approaches are required to deal with complex problem situations (Jackson 2006). Complex systems thinking is important to understand aid efforts (Ramalingam 2013). Complexity science provides a set of valuable, challenging ‘fictions’ that allow us to better explain and understand the complexities of the real world (Ramalingam et al. 2008). Moreover, Greenhalgh et al. (2012) recommends developing an evaluation that can provide information about changes after initial implementation, and qualify a sustainability evaluation using system dynamics.

Hence this study aims to provide and apply a comprehensive post-project sustainability evaluation framework by using a complex systems approach. Although the concept of sustainability is inherently normative, subjective and ambiguous, this study is expected to contribute in regard to the more technical aspects of sustainability concepts. Further, this study is expected to address the multiple aspects of the project sustainability concept—namely continued activities, continued benefits and continued capacity (Stirman et al. 2012)—and to include financial, social and environmental aspects. This study also would answer a question about what has persisted from the original intervention and what has changed (Greenhalgh et al. 2012). In addition, in practice, the findings could be used to improve the sustainability of a project under evaluation by allowing decision makers to

select specific processes and methods, and to assess alternative proposed treatment plans (MacCuspie et al. 2014). Finally, this study may provide information of use to government and donor agencies regarding the sustainability of projects.

3.2 Literature review

3.2.1 International development project sustainability definition

The Project Management Institute (2017, p.4) defines a project as ‘a temporary endeavour undertaken to create a unique product, service or result’. According to this definition, a project is associated with a limited period of work (Shenhar & Dvir 2007; Turner 2006). A programme refers to a set of activities designed to achieve a designated objective (Pluye et al. 2004). An IDP is defined as a public sector project or programme that is usually financed by a donor to deal with the social and economic needs of developing countries (Ahsan & Gunawan 2010). While aid projects address emergency and short-term issues, IDPs deal with a more stable context to support a longer development process (Golini & Landoni 2014; Wu 2016). However, recently the distinction between the two has become blurred (Wu 2016).

The Brundtland Commission of the United Nations in 1987 defines sustainability as ‘development that meets the needs of the present without compromising the ability of future generations to meet their own needs’. A clear definition of sustainability in implementation studies is limited; most do not provide a definition, even when assessing sustainability (Moore et al. 2017). Moreover, there is no single definition of IDP sustainability (Braithwaite et al. 2020; Hailemariam et al. 2019; Lennox et al. 2018; Stirman et al. 2012). The term sustainability is used interchangeably with maintenance, continuation, long term or follow-up (Braithwaite et al. 2020). The ADB relates project sustainability to the probability that project results will be maintained over time (ADB 2010). The definition of project sustainability that is commonly used in the literature

related to IDPs refers to what happens after initial implementation, with the most operational definition referring to the continuation of benefits, activities and the capacity of the project (Stirman et al. 2012). This definition is in line with those proposed by Scheirer (2005) and Shediak-Rizkallah and Bone (1998). Project sustainability also can refer to routinisation and institutionalisation. Routinisation is associated with the sustenance of the organisational routine(s) for a work practice through the mutual reinforcement of principles and practices; and institutionalisation refers to the gradual adaptation of the organisational context to the new work practice (Slaghuis et al. 2011). Pluye et al. (2004) classifies the degree of project sustainability into four categories: the absence of sustainability, precarious sustainability, weak sustainability and sustainability. Sustainability also relates to repeating the performance in the future, and performance is defined as meeting goals (Schreiner 1996). It is crucial to not rely solely on measuring the existence of the project (Lennox et al. 2018) but also to examine conformity with the mission of the project so that the continuation of ineffective or undesirable practices can be anticipated. This refers to the capability of an institution to coordinate human interactions to achieve SDGs (Pfahl 2005); that is, to become a sustainable project, an IDP needs to exist and its operation must at least not contradict or be harmful for future generations (sustainable development). Further, under the definition of sustainability by Schreiner (1996), sustainability involves repeating the performance in the future, where performance is meeting goals and incorporating sustainability dimensions including financial, social and environmental aspects that are important in the project performance. Hence, in this study, project sustainability is associated with the existence of a project after its implementation phase (when donor funding is stopped) and its operation not being harmful for future generations (i.e. not conflicting with SDGs).

3.2.2 Project sustainability evaluation

Research on programme/project sustainability is relatively new and most studies in this area are from health care (Herlitz 2020). Because of constrained timeframes, budgetary and political considerations, evaluation of programme sustainability post-implementation is rarely conducted (Chambers et al. 2013). A systematic integrative review conducted by Braithwaite et al. (2020) about how sustainability is conceptualised and measured in programme evaluations reveals that studies in the area have used inconsistent definitions and measures of programme sustainability, and rarely used theoretical frameworks. These aspects are important as they determine how sustainability is investigated (Stirman et al. 2012). Theories used in sustainability assessment include diffusion of innovations theory, complexity or complex system theory, open systems theory and ecological theory (Lennox et al. 2018).

Sustainability evaluation focuses on examining the sustainability of a programme or its components, continuation or improvement of system outcomes, and both of these (Braithwaite et al. 2020). The main reason for using sustainability approaches is for project analysis, evaluation, assessment, guidance and planning (Lennox et al. 2020). Assessment of resources, project effectiveness (outcomes and impact) and mechanisms for monitoring progress over time are commonly applied in sustainability assessment (Lennox et al. 2018). Further, Lennox et al. (2018) identifies the means used to influence and/or assess project sustainability, including frameworks/conceptual frameworks, tools, models, checklists, guidance strategies and processes. Many sustainability frameworks have been developed with a focus on intervention characteristics that affect sustainability and contextual influences (Shelton et al. 2018). Moucheraud et al. (2020) develop a framework for sustainability evaluation that includes determinants (project/programme specific factors, organisational factors and contextual factors) and outcomes of sustainability (continuation of programme activities and capacity).

In terms of methodology, most sustainability assessment studies are naturalistic rather than experimental (Stirman et al. 2012). Quantitative approaches to identifying predictors, or associating or correlating factors of sustainability; and qualitative and mixed approaches to identifying influences or processes associated with sustainability, have been used for sustainability assessment (Stirman et al. 2012). The ideal approach is prospective, multilevel and mixed-methods (Shelton et al. 2018). Self-report measures, interviews and observation are also commonly used in studies (Stirman et al. 2012).

Therefore, it has been suggested that sustainability evaluation should clearly specify a conceptual and operational definition of sustainability (Shelton et al. 2018; Stirman et al. 2012); specify the dimensions of sustainability that will be addressed; define the intervention's effectiveness (Shelton et al. 2018), characterise the sustainability phenomenon and the influencing factors; and study fidelity and adaptation (Stirman et al. 2012). In addition, a timeframe should be selected (Stirman et al. 2012) that permits changes over time to be examined (Shelton et al. 2018).

3.2.3 International development project as a complex system

A complex system is defined as an ensemble of many elements that are interacting in a disordered way, resulting in robust organisation and memory (Ladyman et al. 2013). In general, a project system can be considered a complex system (Vidal & Marle 2008). Projects are considered complex if they involve uncertainties, a large number of stakeholders and a diversity of skills (Santos et al. 2012). Such projects cannot be completely specified in advance (Ahern et al. 2014). The complexity of a project can also be seen from its connectivity and differentiation (Baccarini 1996). A project is also a social system whose operational definition means that it consumes resources (inputs) to deliver processes, to result in an output (input–process–output model) that is transferred to outcomes (Zwikael & Smyrk, 2012).

Some characteristics of IDPs demonstrate project complexity; namely their project outcomes and goals can be intangible (Golini et al. 2018; Yalegama et al. 2016), and they can be large and varied (Diallo & Thuillier 2004) in terms of finance sources (Bayiley & Teklu 2016; Diallo & Thuillier 2004, 2005; Hermano et al. 2013; Ika & Donnelly 2017) and the environment of the project (Hermano et al. 2013; Ika & Donnelly 2017). Wu (2016) states that IDPs demonstrate four characteristics of a complex system: nonlinearity; connectedness; self-adapting and self-organising; and emergence. Bambergers (2015) shows that the complexity of international intervention is determined by interactions among four aspects: the nature of interventions, institutions and stakeholders; causality and change; the nature of the system and embeddedness; and the evaluation process.

3.2.4 Sustainability of international development project: a complex system view

Theoretical perspectives on programme (project) sustainability consider how sustainability is defined and viewed (Lennox et al. 2018). Sustainability definitions might vary because of different settings and types of intervention (Shelton et al. 2018). Further, the development of sustainability conceptualisation has moved from institutionalisation and routinisation to a more dynamic concept that permits adaptation and capacity building (Shelton et al. 2018). There is no consensus on the definition of a system approach (Chen 1975). However, the approach generally considers the attributes of a whole system to achieve the system's objective, which is problem solving (Jackson et al. 2010).

Sustainability is an evolving and conceptual diversity concept requiring comprehensive and context-specific conceptual understanding to build its rigorous interpretation (Satanarachchi & Mino 2014). Sustainability requires a long-term and balanced relationship between actors and their environment (Espinosa et al. 2008). The conception of sustainability that implicitly contains long-term perspectives and the need for avoiding future catastrophic conditions leads to the importance of visualising

sustainability or unsustainability in complex and evolving entities (Satanarachchi & Mino 2014). Further, sustainability in an organisation involves three integrated dimensions: financial, social and environmental dimensions (Giovannoni & Fabietti 2013).

Sustainability is underpinned by complexity theory (Peter & Swilling 2014). It has a strong relationship with the dynamic patterns and complexity of human–natural systems (Satanarachchi & Mino 2016). Sustainability is a system-level property emerging from the actions and interactions of human agents, the interactions between the social and natural components, and the biophysical processes in the natural system (Tian 2017). Complexity science models such as the viable system model focus on a notion of ‘viability’, which is closely linked with sustainability. Both result from organisations dealing with the complexities of a dynamically changing and evolving environment (Espinosa et al. 2008).

Sustainability involves complex dynamic processes and shifts through transitions. These transitions are multidimensional, long-term and fundamental transformation processes towards socio-technical system shifts to more sustainable modes of consumption and production (Markard et al. 2012). A large number and variety of parties and interests are involved in the transformation process (Markard et al. 2012). Sustainability transition is a field of high complexity; therefore, complexity theory takes a central role in the understanding of the transition towards sustainable development (Loorbach & Rotmans 2006). Key modelling themes of complexity theory are required to model transition towards sustainability; namely emergence (internal dynamic and perceptual), stability conditions, transitions and hierarchy (Peter & Swilling 2014).

Within a systems perspective, sustainability refers to the ability to persist, adapt, transform or transition to deal with constant changes (Williams et al. 2017). Through a system approach, sustainability is associated with the non-declining valuation function of the outputs of interest of the system considered (Gallopín 2003). Sustainability is also viewed as a process of returning to the norm (homeostasis) or adapting to the environment

to survive; therefore, an organisation is viewed as an organism open to environmental influences and the need to adapt to them (Lennox et al. 2018). Espinosa, Harnden and Walker (2008) define a viable system as ‘a system or complex entity capable of maintaining an independent existence’. Harrington (2016) emphasises the important aspect of maintaining the productivity of system capacity when applying sustainability for management and policymaking. Sustainability of health programmes results from processes occurring in the local system where various stakeholders share the responsibility for producing and maintaining health outcomes for their community (Sarriot et al. 2014). Further, sustainability of a system refers to sustainability of the system itself—namely when the output(s) is the same as the state variables (e.g. the preservation of a natural ecosystem)—and the sustainability of the output(s) of the system, namely when the output(s) is different from the state variables (e.g. agricultural yield of an agroecosystem) (Gallopín 2003).

Bossel (1999) develops a general scheme for identifying a system’s viability indicators: existence, effectiveness, freedom of action, security, adaptability, coexistence and psychological needs. To exist, a system must receive the material inputs, energy and information necessary to sustain itself (Bossel 1999). Mobus (2017) proposes the necessary conditions for sustainability of a complex system that include the producing valuable outputs (fulfilling a purpose), receiving rewarding (essential) inputs, being adaptable, being evolvable and being lucky. What the system ‘does’ and its behaviour rely not only on the system but also on the inputs and outputs of the system (Gallopín 2003). These, in line with the logical framework widely used as a development programme methodology, an IDP implementation involves the four essential components of inputs, activities, outputs and outcomes (Savaya & Waysman 2005).

Sustainability also requires better governance as a prerequisite that can foster, coordinate and guide positive work by many actors (Kemp et al. 2005). Hierarchical

cybernetic governance, which helps a system achieve the necessary capabilities (adaptability, evolvability and resilience), helps the system move towards sustainable existence (Mobus 2017). Thus, system governance is required to govern the system (including sub-systems, stakeholders/actors) to achieve its goals. Further, feedback mechanisms are important to connect the system with the environment. As an existing system must be compatible with the environment (Bossel 1999), feedback mechanisms help maintain homeostasis, which contributes to the system's resilience towards a sustainable system. The ability of feedback loops to analyse possible future scenarios without compromising a system or experiment is important for sustainability (Rodríguez-González et al. 2020).

It can be said that to be able to exist, an open system requires components involving inputs and processes to transform them into an output. Further, system governance is required to coordinate the system, and feedback mechanisms are needed to ensure the system receives and addresses information from the environment. Therefore, sustainability of a project as a system refers to the existence of the system's components (input, process, output, system governance and feedback mechanism) to achieve its goals/mission; further, the mission should not be harmful for future generations, nor conflict with SDGs.

3.2.5 Case study context: Microfinance project sustainability

Microfinance provides financial services for the poor (CGAP 2002). Microcredit and poverty are key terms associated with microfinance (García-Pérez et al. 2017). Further, RLF projects are associated with funds for microcredit for the poor with interest, so that the funds can be revolved. A RLF is a type of community-managed loan fund where credit for a small group member is managed by the member themselves, without professional management and supervision of the approval, disbursement and collection (CGAP 2006). Hence in this study, the RLF project is associated with microfinance. This refers to credit

based-microfinance projects funded by government, international development agencies in a limited time as part of a larger rural development programme (Zeller 2006).

Microfinance projects have two goals: providing the poor with access to financial services (social goals) and being financially sustainable (financial goals). Providing financial access for the poor makes microfinance a costly business because of high transaction and information costs (Hermes & Lensink 2011). Long-term services for the poor can only be provided by MFIs that are financially sustainable, yet a large number of MFIs still rely on subsidies from government or donor agencies (Hermes & Lensink 2011; Hermes & Hudon 2018) and could collapse when subsidies are stopped. This creates the institutionalist paradigm that relies on financial self-sufficiency to achieve microfinance sustainability and avoid subsidies (donations) (Brau & Woller 2004). Institutionalists argue that long-term and large-scale outreach cannot be guaranteed if MFIs are not financially sustainable (Hermes & Lensink 2011). This paradigm has dominated the microfinance industry (Brau & Woller 2004; Hermes & Lensink 2011; Morduch 2000). Institutionalists argue that the failure of rural credit agencies occurs because of the lack of institutional viability; hence institutional sustainability is key to successful microfinance (Brau & Woller 2004). Conversely, a welfarist paradigm argues that microfinance can achieve sustainability without achieving financial self-sufficiency; hence allowing donations (subsidies) (Brau & Woller 2004). They reason that credit is used to help alleviate poverty. Since the poor cannot afford high interest rates, subsidised interest rates are offered (Hermes & Hudon 2018). Thus, subsidy reduction has worsened social performance (D'Espallier et al. 2013). MFIs that are more focused on commercial interests (operational sustainability and return on asset) tend to move away from the social mission of serving the poorest of the poor (Mia & Lee 2017). Aiming for financial sustainability is ultimately opposed to the goal of helping large groups of poor borrowers (Hermes &

Lensink 2011). MFIs shifting their focus from social performance towards financial performance has been referred to as mission drift (Hermes & Hudon 2018).

CGAP (2002) and Pollinger et al. (2007) define microfinance sustainability as the ability of a MFI to cover its annual budget. It is measured by the ability to cover its costs from its revenues, earn profit and operate without donations or subsidies from the government or other donors (Mahapatra & Dutta 2016). Despite a recent study beginning to conceptualise a holistic perspective of microfinance sustainability, it considers only the financial aspect of MFIs' profits and their long-term existence (García-Pérez et al. 2017). Bhanot and Bapat (2015) provide a more holistic concept of microfinance sustainability including financial and outreach aspects. This concept is in line with the IDP sustainability definition mentioned above. It is associated with the existence of a project after its initial implementation (when donor funding stops) and the conformity of its operation with future generations and SDGs. Hence, in this study, sustainable project-based microfinance is associated with the persistence beyond initial implementation of a microfinance project (MFI) that can cover its costs without receiving subsidies from government or donor agencies and departing from its social mission, and whose operations conform with the goal of not being harmful for future generations (i.e. not conflicting with SDGs).

3.3 Methodology

This qualitative case study research aimed to develop a framework for assessing post-project sustainability and apply the proposed framework in a microfinance (RLF) project. Qualitative research has an important role in efforts to understand IDPs, refine hypotheses and develop strategies to promote sustainability (Stirman et al. 2012). Qualitative case study is an appropriate research approach to study complex phenomena and their contexts (Baxter & Jack 2008; Noor 2008; Tellis 1997) and can create a detailed

understanding of the system (Walton 2014). Thus it is suitable for a complex system such as an IDP.

Data from the field were obtained through interviews, observation, document review and a FGD. The case study of the RLF (microfinance) project in the Tegal district, Central Java Province, Indonesia was used to implement the framework. The project was implemented in 2007–15 as a cooperation between the Indonesian government and international development agencies including the World Bank. Therefore, the focus of this study is evaluation of the sustainability of the institutions involved (AMUs as MFIs). There are 13 AMUs/MFIs in the district and all were involved in this study.

A thematic analysis, defined as a method for identifying, analysing and reporting themes within data (Braun & Clarke 2006) was employed in this study. Further, this research applied a theoretical and deductive approach to data analysis (Maguire & Delahunt 2017; Pears, 2019) rather than an inductive one. A deductive thematic analysis utilises theory or a conceptual framework as its point of departure (Pearse 2019). This research involved several steps including developing an initial framework and applying the proposed framework in the case study. Further, the framework was refined during the coding process of data analysis. A literature review was conducted to develop the framework and generate a code book. The code book was applied to the data collected for theme identification and it adjusted during coding process Finally, the results were reported.

3.4 Result: Complex system approach to ID project sustainability evaluation

3.4.1 The proposed framework

3.4.1.1 Project sustainability evaluation framework by using a complex system perspective

The existence or continuation of an IDP after its implementation phase is necessary for a sustainable IDP, and its operation must not be not harmful for future generations and

must be in line with SDGs. Moreover, the system's existence can be assessed on the basis of its components, including mission, input, process, output (including performance), system governance (including stakeholders and sub-systems) and feedback mechanisms. Further, as a complex system, a project interacts with its environment; hence, identifying the project's boundary and environment is important for its existence. Therefore, sustainability of a project viewed as a complex system refers to the existence of the project after its implementation, assessed by examining the project's components to generate and/or maintain designated outputs/outcomes to achieve the desired mission (Figure 9). As sustainability should be assessed by comparison with two or more systems, a comparison of the system elements with the original intervention and other criteria should also be conducted.

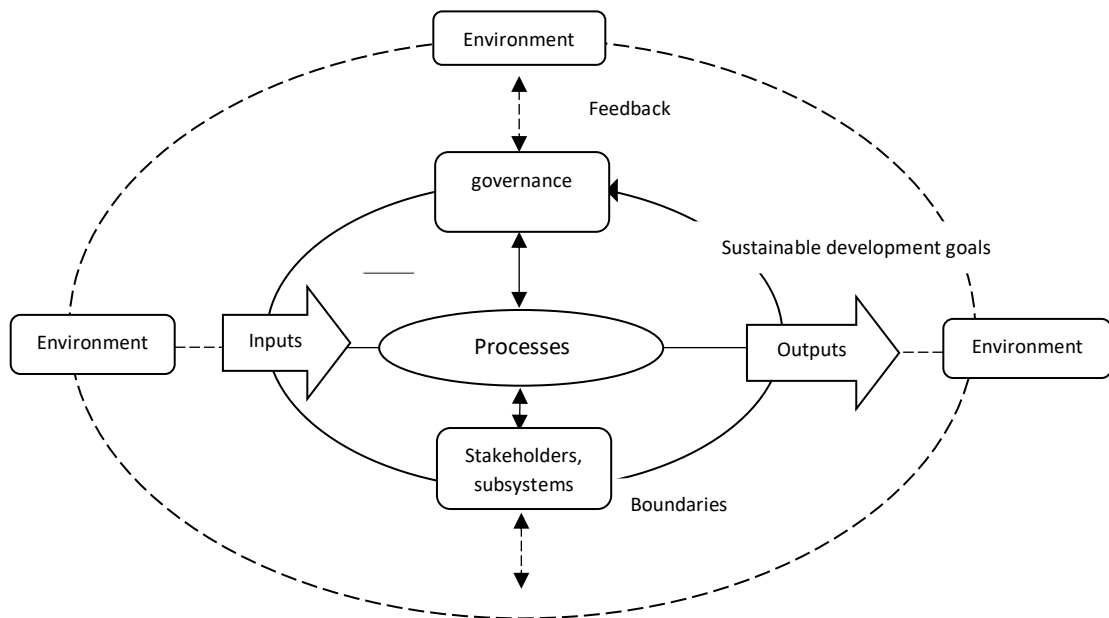


Figure 9: Project sustainability evaluation framework by

Mission

As a public project, the mission (objective) of an IDP refers to public interests, namely achieving SDGs with the ultimate mission of world prosperity. Assessment of the objectives of a continuing project is conducted to ensure that they are not harmful for future generations and aligned with SDGs. The objectives of the project may drive other components of the project such as input, process and output towards mission achievement. It is important to ensure that the outcomes of a continuing project benefit the community, and discourage ineffective or undesirable practices. Hence, evaluation of the objectives of an IDP may help to ensure that there is no mission drift from these desired goals.

Input

Input includes the required resources (Parsons et al. 2013), which can be human, knowledge, financial, technology and other materials. These resources proceed through activities to produce outputs.

Process

The process is related to the activities that occur to produce outputs. Activities are related to what the project does. They include work performed and actions taken through which inputs are mobilised to produce the desired outputs.

Output

Outputs are what the project produces (Parsons et al. 2013), which can be products in the form of goods or service. The outputs are released to the recipients of the project and its environment. Along with identifying the type of output, measuring outputs is also important as they demonstrate the performance of the project. The degree of project sustainability is determined by the performance of the project, and Schreiner (1996) defines sustainability as repeating the performance in the future. Assessment of performance should include economic, social and environmental dimensions.

Governance

Governance is associated with the mode of coordination (Kemp et al. 2005). System governance is defined as ‘design, execution, and evolution of the higher-order (metasystem) functions necessary to provide control, communication, coordination, and integration of a complex system’ (Keating et al. 2015). Therefore, assessing the system governance of a project may provide information on how the system is managed and coordinated. It is also important to identify the stakeholders and sub-systems of the project.

Boundary

A boundary is an important element of the system approach that helps in defining the system (Jackson et al. 2010); it separates the system from the environment. It defines the system’s *identity* and *autonomy* (Bossel 1999). In social service delivery and inquiry, boundaries outline the simple rules or limits that guide agents’ behaviours, preferences and decisions (Wolf-Branigin 2013). The boundary in this research refers to the system’s (project’s) boundaries that define and separate it from other projects and its environment. Boundaries may come from project activities, legislation, policies, social norms, cultural values and resources.

Feedback mechanism

Feedback is a mechanism whereby the output of a system is redirected to the input itself, which changes current behaviour based on previous behaviour (Rodriguez-González et al. 2020). It also refers to reactions to the output resulting from the system. Therefore, the return of information about the system could come from the environment. Information on feedback mechanisms is important for understanding the interaction of a project with its environment and for addressing issues that can impede its sustainability.

Environment

Information on a system’s environment is important, because to exist and be viable, a system must be compatible with its environment and characteristic properties (Bossel 1999). The environment of the system is associated with others outside the system, which

may be other relevant systems. A summary of a project sustainability evaluation criteria is presented in Table 3.

Table 3: Project sustainability evaluation criteria

Elements	Explanation	
The system	State the definition of the system under consideration	
Mission	Goals of the system (project)	State the mission that is intended to be achieved by the system and ensure that the mission/goals and all materials used, activities conducted and resulting products are not harmful for future generations and do not conflict with SDGs
Input	Resources are required to run the system	Identify and explain the inputs of the system
Process	Activities that occur to produce outputs	Identify the processes/activities within the system
Output	Products or services resulting from the system, including performance of the system; performance aspects involve economic, social and environmental performance	Identify the outputs (products/services, performance) of the system
System governance	Mode of coordination (management) within the system	Explain the management/coordination mode of the system
Boundary	The system's identity (characteristics) that separates it from its environment	Identify the boundaries of the system
Feedback mechanism	The return of information about the system	Identify how the system obtain return information
Environment	Others outside the system, which could be other relevant systems	Identify other relevant systems

3.4.1.2 Guidance to implement the framework

To provide technical guidance regarding the framework, guidelines have been established to implement the framework (Figure 10). Evaluation is a cyclic activity where the results from the most recent evaluation are a starting point (baseline) for the next evaluation. Details of the steps involved are described below.

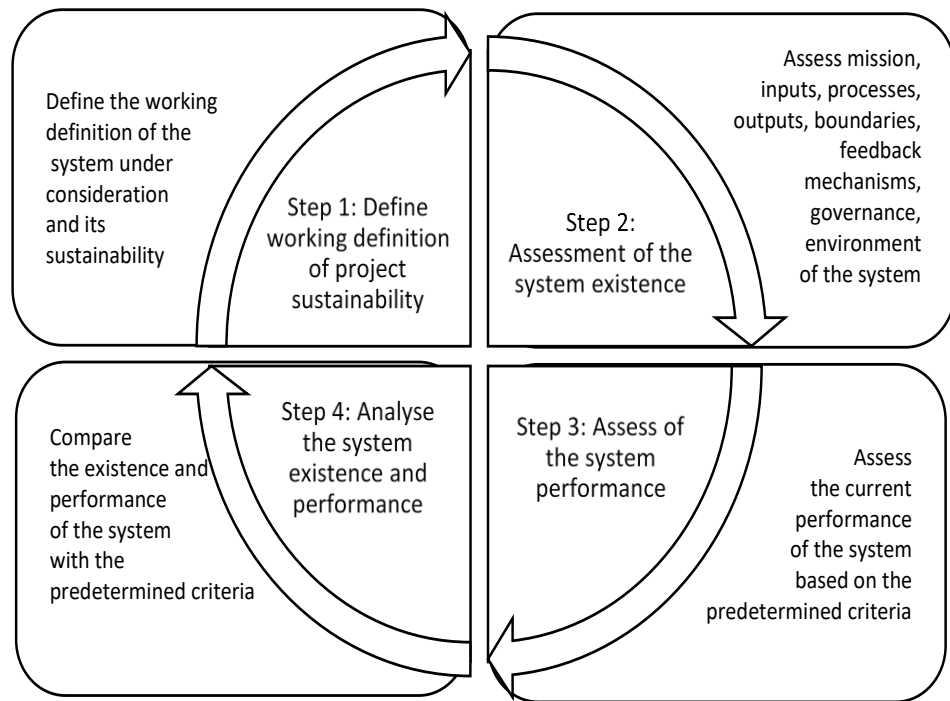


Figure 10: Guidance for implementing post-project sustainability evaluation framework

Step 1: Define the working definition of the system under consideration and its sustainability

This step is undertaken to provide clear information about the evaluation and the specific meaning of sustainability in the evaluation context. It involves the definition of post-project sustainability, post-project sustainability in the specific project context, the system under consideration, the system sustainability definition and its evaluation, timeframe, system level and unit analysis, criteria and the baseline to be used. Although there are no specific rules regarding the timeframe, Stirman et al. (2012) reports that most studies on sustainability evaluation are performed two or more years after implementation.

Step 2: Assess the existence of the system

This step focuses on identifying the mission, input, process, output, system governance (including stakeholders and sub-systems of the project), boundaries, feedback mechanism and environment of the project under evaluation. The results from this step

demonstrate the current state of the system. The mechanism of how the project works after financing stops may also be identified. A project is considered to exist if all the components of the system can be identified. Visualisation of the current system enhances information about the system's existence.

Step 3: assess the current performance (output) of the project

To assess the current performance of the project, the criteria that will be used to measure system performance should be identified, explained and demonstrated. Measurement focuses on outputs that can be controlled by the system; thus, the performance measure to be used depends on the type of output resulting from the system, which can be goods or services. One of sustainability characteristic is applying triple-bottom-line criteria (Silvius 2017); therefore performance measures include economic, social and environmental dimensions. The result will be the current performance of the project.

Step 4: Determine/assess the sustainability of the project

This step compares the current project with the project as originally implemented. It includes a comparison of the project's components and their performance to provide information on the continuation of activities, benefits and capacity. Questions about what has persisted from the original intervention and what has changed can be answered. The degree of project sustainability might be assessed by examining the existence of the system's components and the alignment of the mission of the system with the ultimate mission of the IDP, and comparing these with the original implementation. To enhance project sustainability information, the system's performance should be compared against certain criteria such as past performance, other similar project performance and performance standards.

3.4.2 Application of the framework: a case study of a microfinance project

4.3.1 The microfinance (Revolving Loan) project in the Tegal District

The sustainability of a project is measured by assessing the existence of the project (mission, input, process, output, system governance, feedback mechanism and environment) after its implementation phase, independent of subsidies and retaining its social mission. Thus, its operation should not be harmful for future generations (i.e. not in conflict with SDGs).

The Tegal district of Central Java Province is located between 1080°57'6"E and 1090°21'30"E longitude, and 60°50'41"S and 70°15'30"S latitude. It has 18 sub-districts and 287 villages, with a total population in 2020 of around 1.6 million, 117,500 (8.14%) of whom are poor. The district is dominated by the manufacturing and trade sector (50%), with gross regional domestic product in 2020 of 35.319,84 billion IDR and Human Development Index of 68.39.

The RLF project part of the PNPM Rural launched in 2007 and ended in 2015. The programme was designed as a CDD programme for rural areas and involved cooperation between the Indonesian government and international development agencies. AMUs were formed in every sub-district including in Tegal district to manage the grants, including a microfinance scheme through the RLF project. Therefore, the AMUs' activities covered a sub-district. The mission of the project was to empower the villagers and alleviate poverty by providing microcredit, mainly for productive poor women. Through this project, the government provided grants to finance the RLF project managed by the AMUs and required AMUs to provide loans for productive poor households; mainly women who needed funding for their business activities. Before being approved by the government, each grant application had to be approved by an Inter-village forum (IVF) (see Figure 11). In addition to a grant for microcredit, the government allocated 2% of the grant for the AMU's operational costs.

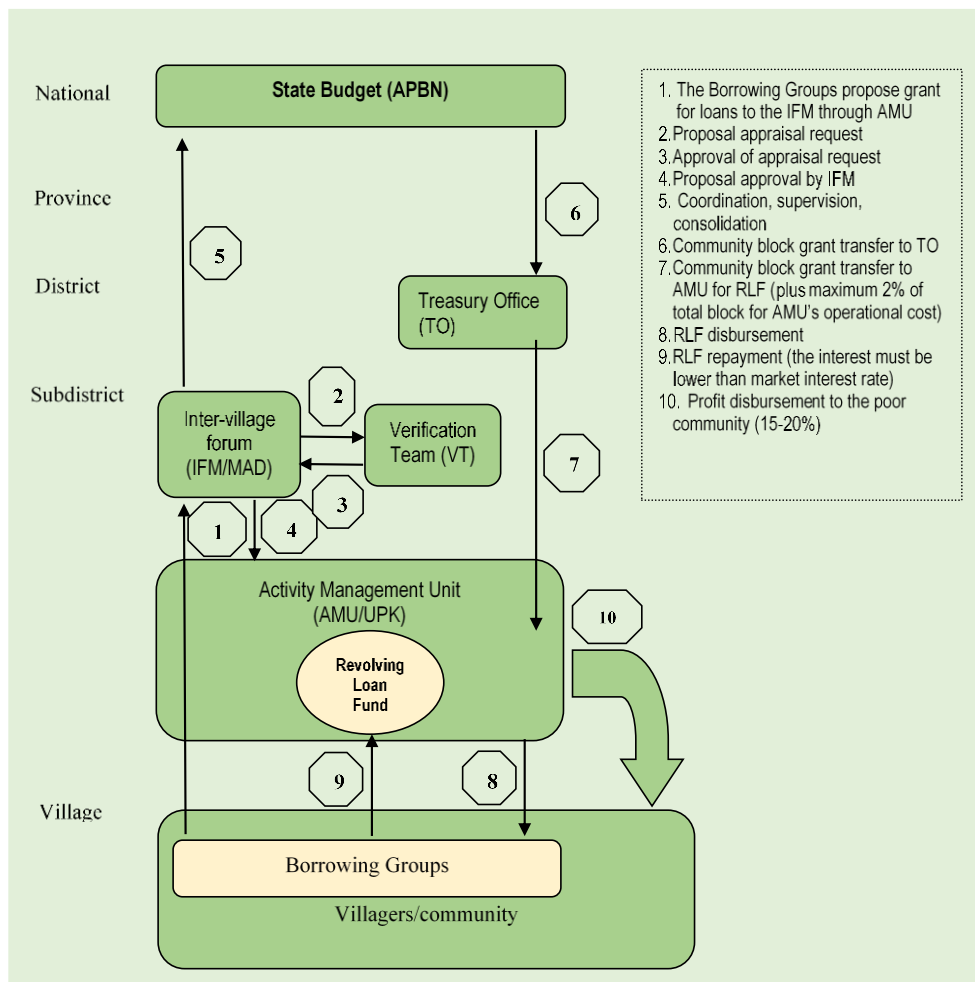


Figure 11: PNPM-Revolving Loan Fund Project Mechanism

There were 13 AMUs in the Tegal district at the project implementation stage and all were still in operation four years after the programme funding completion. The activities of those 13 AMUs after project implementation have involved managing microcredit; hence they are operating as MFIs.

4.3.2 Evaluation of the RLF project sustainability in Tegal district

Stage 1: defining the working definition of the system under consideration and its sustainability

The system being evaluated here is the RLF (microfinance) project of PNPM Mandiri project community-based project in the Tegal district of Central Java, Indonesia. Project sustainability is defined as the existence after initial implementation of a project

that can cover its costs without discarding its social mission and not harmful for future generation nor conflicting SDGs. The evaluation assessed the system's components including goals/mission, input, process, output, system governance, feedback mechanism, boundary and the environment. The timeframe for the evaluation was four years after project completion (i.e. 2018). Performance of the system was assessed according to financial measures—total assets; operational self-sufficiency (OSS), which measures how well the MFI can cover its costs through revenues; return on asset (ROA), which measures how well the MFI is managing its assets to optimise profitability; and portfolio at risk (PAR), which indicates the potential for future losses based on the current performance of the loan portfolio—as well as social measures: breadth and depth of outreach, which measures how the MFI serves the poor; interest rates; loan requirements; funds provided for borrower/community/institutional development; and environmental awareness. Additionally, the baseline criterion used to determine/assess the sustainability of the project was the condition—that is, the existence and performance—of the project at the end of its implementation period (2014).

Stage 2: assessing the system's existence (current)

The results of the system assessment are presented in Figure 12. The project exists and continues to operate to provide microcredit to the villagers. The AMU is a non-profit-oriented organisation but is generating income to sustain its activities and offers mutual cooperation value and local value. The mission of the project is to empower the villagers and alleviate poverty by providing microcredit with easy access. The project is no longer part of a government system with a hierarchical structure. The AMU/MFI is owned by the community in each sub-district and is coordinated by an AMU association. Under the governance of the IVF, the project continues to acquire its inputs and process them to produce outputs.

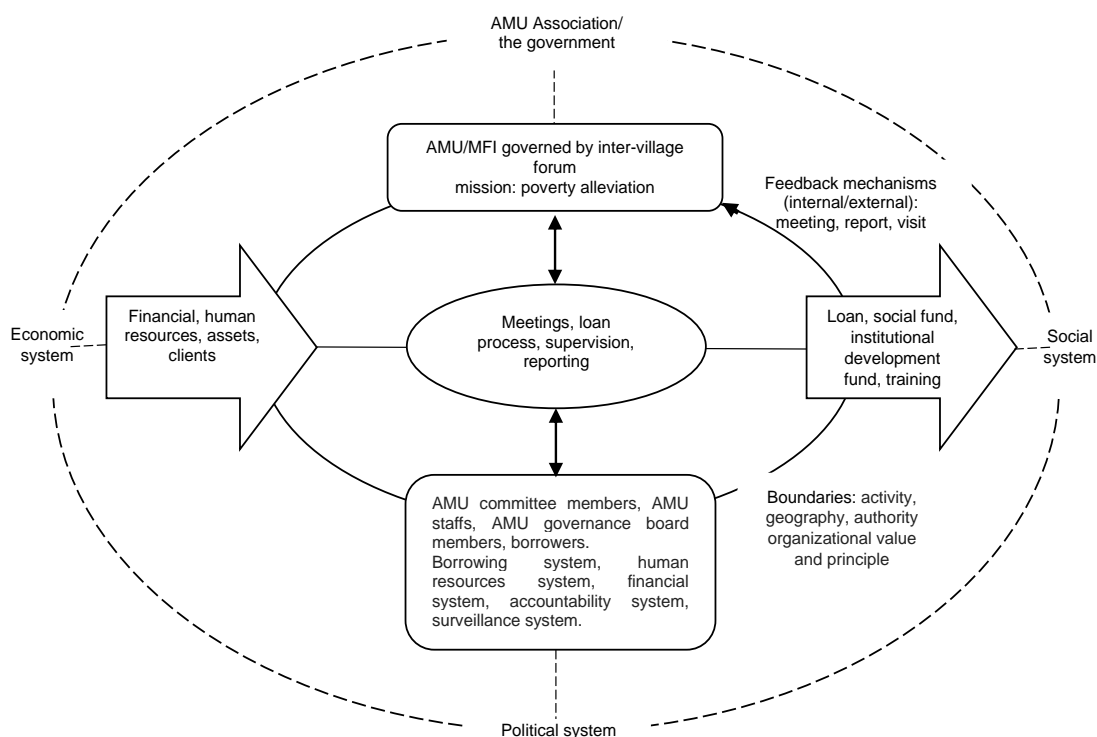


Figure 12: Sustainable microfinance project in the Tegal

Stage 3: assessing the system performance (Average in the district)

Two dimensions of microfinance performance were measured, namely economic/financial and social dimensions (including environment aspects). The total assets of the 13 AMUs at the time of data collection was 71,783,585,171.64 IDR (4,950,592 USD), the OSS ratio was 2.42, the ROA ratio was 0.10 and the PAR ratio was 0.20. Further, the AMUs had served 18,474 borrowers (outreach breadth) with average loans of 3,312,699 IDR (outreach depth) and average interest rate of 18%. The loans are offered to the productive poor, especially women or microentrepreneurs or villagers in the sub-district, and involve group-based lending with no collateral and no administration fees. The AMUs also provide funds for village development (through borrower, community and institutional funds) and most (92%) follow the environmental guidance of initial project implementation.

Stage 4: Determine/assess the sustainability of the project

The project exists and its mission has not changed; that is, it still seeks to empower villagers and alleviate poverty by providing microcredit (with easy access). Therefore, the project can be considered a sustainable project. Even though the AMUs do not receive funds or subsidies from the government, they can operate with their profits. The microfinance business has become a routine activity run by the 13 AMUs. However, their organisational characteristics have changed from being non-profit-oriented to generating profit, and profit is important to run the activities to achieve the project's mission. Notably, the AMUs have not increased the interest rate and still provide social benefits to the villagers. The project has received sufficient inputs, mainly from financial resources (profit) and produced the essential output of providing microcredit for villagers. It maintains assets and human resources to serve the villagers. Moreover, processes in the MFIs also run as they did at the project implementation stage; they conduct the loan process with the same requirements, supervision of borrowers, internal and external meetings, and creation of reports for accountability to the inter-village forum. The outputs remain unchanged, and include loans, social funds, institutional development funds and capacity building (training). However, the governance system has changed; it is now fully managed by the community and is not part of a government project. The AMUs are not obliged to report to the government; there are no facilitators to assist in daily operations; and no formal, regular surveillance by the government or international agencies.

With respect to financial performance, the total assets have increased because of the profit earned by the AMUs. The financial ratios (OSS and ROA) were greater than 1 and the project can cover its costs using its profits, and continue to operate. However, the OSS ratio decreased because of cost increases when government subsidies stopped. The PAR decreased slightly, but is still more than 10%, which must be a concern for the AMUs' management. The PAR is an important indicator of microfinance sustainability as

it demonstrates the quality and risk of loans. The absence of a write-off policy in some AMUs caused the PAR ratio to be high.

The social performance measures for the project demonstrated a decline in outreach breadth and an increase in outreach depth. It is caused by, when project was implemented there were grants from the government and the application approval process was lax. Conversely after the project closure there are less funds are available, more stringent on the application approval, the limited business coverage and service competitions with other financial services. The increased outreach depth was due to the fact that most of the borrowers were not new borrowers but had borrowed for a long time, which meant that they had gradually increased their loan amounts and caused competition with other financial services and a reduction in the number of borrowers. In regard to other social performance criteria, the AMUs are still applying the same interest rates, allocating funds for the community and institutional development, and applying easy-to-meet loan requirements. Even though the social performance has not improved noticeably, the AMUs still perform well on social goals. In terms of environmental performance, the project shows no significant changes. The AMUs simply follow the rules of their initial project implementation, which state only that a loan cannot be used for activities or businesses that damage the environment. (the detailed findings on the application of the framework to the RLF project can be seen in appendix 2).

3.5 Discussion

A complex system approach is applicable to post-project sustainability evaluation and the application of the developed framework may provide comprehensive information about the sustainability of the project. The cycle processes (stages) in the implementation guidance of evaluation framework would be able to records continuous changes within an intervention as recommended by Stirman et al. (2019). Identification of the system's

components of input, process, output (performance), project governance, feedback mechanism that shows the existence and how to run the project years after the project implementation is in line with the project sustainability definitions of Scheirer (2005) and by Shediak-Rizkallah and Bone (1998). This may demonstrate the routines followed by the project and how it runs. It also supports aspects of project sustainability dimensions outlined by Stirman et al. (2012), namely continued activities, continued benefits and continued capacity. By identifying the current mission of the project and linking it to its operation that should not be harmful for future generations and conflicting with SDGs, the framework might also detect ineffective or undesirable practices, as required by Lennox et al. (2018). Comparison between the initial and current conditions of the project can identify what persists and what has changed since the initial project, as recommended by Greenhalgh et al. (2012). Additionally, changes in the system components show that sustainability is a dynamic process (Shediak-Rizkallah & Bone 1998) that embodies a tension between retaining past practices and adapting to a changing context (Greenhalgh et al. 2012). Therefore, the ability of a project to deal with changes through adaptation and learning is important for its sustainability.

In relation to application of the framework in the case study of the microfinance projects, the results show that subsidies may affect the MFIs' performance. The financial ratios declined because of a lack of government subsidies, which led to higher costs. Social performance was also affected. Fewer funds that were provided for loans (because no more grants from the government) led to reduce of the breadth of outreach. This supports the finding by D'Espallier et al. (2013) that subsidy reduction worsens social performance. However, both financial and social goals were still be achieved by the MFIs with acceptable risk. Several conditions (reasons) that led to fluctuation in financial and social performance suggest that comprehensive information is required to analyse the sustainability of MFIs. Even though measuring ratios is important, relying solely on these

ratios might not be sufficient for the analysis. As sustainability is a complex concept, comprehensive information is required.

The phenomenon also indicates that the two paradigms in microfinance sustainability (institutionalist and welfarist) could be synergised. Profitable MFIs with no funding from government and donor agencies may continue to operate without receiving subsidies and discarding their social goals, but might reduce their social goal achievement. Rather than moving to a profit-oriented institution, the AMUs chose to become a semi-profit-oriented organisation that earns income to ensure that the organisation runs without changing its mission and principles; increasing interest rates; changing loan requirements; or eliminating funds for institutional/community development. Hence, the AMUs can continue to operate independently from donors without losing their status as social institutions empowering communities to reduce poverty.

In terms of environmental performance, the project showed no significant change. The AMUs simply follow the rules of the initial project implementation, which state that the loan cannot be used for activities or businesses that damage the environment. No further significant related environment actions were taken by the AMUs. This implies that project design and implementation are important (Shediac-Rizkallah & Bone 1998) as they are tools for knowledge transfer from the project to society and are used as guidance by the society. This supports the finding of Pluye et al. (2005) that sustainability and implementation are concomitant processes, and thus that planning for project sustainability at the outset is important.

Finally, this study has limitations and identifies areas for future research. The framework does not consider risk in the project sustainability analysis. Detailed factors that influence the sustainability of the project are also not assessed. The framework focuses on controllable components and gives less attention to impact assessment. This research used only one case study; enlarging the case study sample by applying the framework to

microfinance in other areas, to other types of IDP and many levels of organisation is necessary. This study had limited access to AMUs, the data were mainly obtained by interview, FGDs and reports from AMU leaders as the main participants. Involving more project stakeholders and experts is suggested for future research. Further, research might be conducted on analysing the capability of a project to adapt and learn, making changes towards a sustainable project. Investigating interactions among system components/sub-system and exploring the role and contribution of individuals or stakeholders in making the project sustainable are imperative. Further, examining the main characteristics or attributes of complexity possessed by a project that makes it sustainable is important. Measuring the effect and contribution of the sustainable project to community sustainability and sustainable development (impact assessment) would provide more comprehensive information. Exploring factors that influence a project towards a sustainable system is also crucial. Additionally, investigating models of project implementation that can lead to a sustainable project is important. Finally, exploring the most appropriate supporting policy to be implemented by the government to ensure sustainability of the project is also vital.

3.6 Conclusion

The need for sustainable intervention to achieve sustainable development, and the complexity of development intervention have increased the demand for a new approach to project sustainability. Evidence regarding sustainable IDPs will determine the long-term benefits of the project in reducing poverty, and provide a foundation for sustainable economic development. A post-project sustainability evaluation framework using a complex system approach will help to provide evidence on sustainability of projects. A complex systems approach is applicable to post-project sustainability evaluation and the application of the framework may provide comprehensive information about the

sustainability of IDPs. The framework developed here explores the mission, input, process, output, system governance and feedback mechanism of a continuing project, which may be informative about project sustainability. To implement the framework in practice, four steps are provided as guidance. By assessing those aspects, the framework might address the multiple aspects of the project sustainability concept, namely continued activities, continued benefits and continued capacity—including financial, social and environmental aspects. Further, the framework will help to provide information about the persistence of practices and changes that have occurred in the project; routinisation; how a project runs and is governed after its implementation; the current performance of the project and a comparison between the current and the past (baseline) performance; and the possibility of detecting ineffective or undesirable practices.

A case study of a microfinance project in Tegal district was conducted to implement the framework. The project exists and its mission to empower villagers and alleviate poverty by providing microcredit (with easy access) has not changed. Microfinancing has become a routine activity for the continuing microfinance project, which is governed by the AMUs; thus, the project can be considered a sustainable project. Without further funding support from the government and given that it mainly relies on profits, the project is able to maintain the processes required to produce the desired outputs. Some changes have occurred within the project such as in organisational characteristics and governance systems. With regard to financial ratios, even though the project can cover its costs using its profits and continues to operate, the PAR is still greater than 10%, which must be a concern for the AMUs' management. The AMUs still perform well in the social dimension, although they have shown a decline in outreach breadth and an increase in outreach depth, and their environmental performance remains the same as during project implementation. The results show that although subsidies might affect the MFIs' performance, they can still meet both financial and social goals. This implies that the two

paradigms of microfinance sustainability might be compromised, and both financial and social goals can still be achieved by unsubsidised MFIs with acceptable risk. The identified limitations related to the framework and the research provide recommendations for the future research agenda.

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Chapter 4 : Paper 3 - Microfinance Programme Sustainability Analysis Using Complex System Approach

This chapter presents the second part of the analysis, namely developing an understanding of the sustainability of the microfinance, particularly the RLF project in Central Java Province, Indonesia, using a complex system approach. The analysis includes identification of contextual circumstances and a transition analysis. The identification of contextual circumstances involves identifying issues that arose due to closure of the project and the actions taken to deal with those issues that lead to the sustainability of the project. The transition analysis explores the attributes of core theoretical concepts of complexity theory in relation to sustainability of the project.

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Overall percentage (%)	70%
Certification:	This paper reports on original research I conducted during the period of my Higher Degree by Research candidature and is not subject to any obligations or contractual agreements with a third party that would constrain its inclusion in this thesis. I

	am the primary author of this paper.		
Signature		Date	04/04/2022

Co-Author Contributions

By signing the Statement of Authorship, each author certifies that:

- i. the candidate's stated contribution to the publication is accurate (as detailed above);
- ii. permission is granted for the candidate to include the publication in the thesis; and
- iii. the sum of all co-author contributions is equal to 100% less the candidate's stated contribution.

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Abstract

IDPs such as microfinance programmes and their sustainability are complex, and context plays a crucial role. However, most of the interest in understanding the sustainability of interventions is independent of the context in which the interventions are delivered. This study aimed to analyse the sustainability of a microfinance programme (the RLF project) via a complex system approach. Data were collected by document review, observation, interviews and focus group discussions. They were analysed in two stages: identification of contextual circumstances and transition analysis. The results revealed that some issues arose as a result of closure of the project and the actions taken to cope with those issues led to sustainability of the project. They are related to project governance, accountability, capital and profitability, competition and empowerment. The analysis also showed that the move towards a sustainable project presents characteristics of a complex system, including interconnectedness, feedback, adaptive capacity, self-organisation, and emergence (IAFSE). These findings have implications for microfinance sustainability management and microfinance programme design. First, they show the importance of effective stakeholder management, leadership and a network-based governance system. Second, they suggest flexibility should be included in programme design, planning of the governing body, accountability and control mechanisms after project completion, equipping the community with knowledge and skills, and recruiting the right people.

Keywords: microfinance programme sustainability, complex system, microfinance management, microfinance programme design

4.1 Introduction

Development projects such as microfinance programmes are considered an effective tool to overcome human development issues such as poverty. They can ensure

long-term benefits through access to financial services that enable the poor to build assets, increase productivity, earn an income and achieve food security (Thapa 2006). However, sustainable development projects that involve microfinance are rare (Dieckmann 2007) and only 23% of MFIs operate without donations (D'Espallier 2013). Even when an initial implementation is successful, such projects do not necessarily continue as originally implemented (Stirman et al. 2012). It may be difficult for an MFI to operate and achieve sustainability in remote rural areas (Thapa 2006). Traditionally, various types of explicit or implicit subsidies have sustained rural financial institutions (Yaron 1994).

Further, development projects are complex (Golini & Landoni 2014; Ramalingam et al. 2008; Sarriot & Kouletio 2015) and context plays a crucial role (Ika & Donnelly 2017). Interventions that take into account complex adaptive system characteristics may hold promise for more successful practice change (Suter et al. 2011) and may achieve sustainable outcomes (Sarriot & Kouletio 2015). However, most interest in understanding the sustainability of interventions is independent of the context in which the interventions are delivered (Chambers et al. 2013). Further, the literature examining the extent, nature or impact of adaptations to programmes or interventions once implemented is very limited (Stirman et al. 2012).

An MFI is a system that operates in a dynamic environment of evolving heterogeneous rational agents who interact with each other and with their environment (Bourhime & Tkiouat 2016). This presents complex system properties including interaction, emergence and reactivity. Sustainability of MFIs can have organisational, financial and managerial aspects, although financial sustainability has been most studied in the mainstream literature (Thapa 2006). Studies of microfinance sustainability emphasise an institutionalist paradigm that focuses on financial sustainability (Brau & Woller 2004) according to financial ratios. Economic aspects of microfinance have dominated the contributions of the microfinance literature to sustainability (García-Pérez

et al. 2017). Given the dynamic nature of the complex systems into which innovations are introduced, mutual adaptation between the intervention and the organisation/system, or interactions among stakeholders in various roles within the system is required to sustain a project (Stirman et al. 2012). Therefore, there is a crucial role for complexity theory in understanding the transition towards sustainable development (Loorbach & Rotmans 2006). This study analyses sustainability of the microfinance programme (the RLF project) in Central Java Province using a complex system approach.

The paper is structured in six sections. The first is an introduction that describes the background and importance of the study. The second is a literature review that is used as the theoretical framework for this study. The third section outlines the methodology of the research. The fourth presents the results of the study, including identification of issues arising following project closure and analysis results regarding sustainability of the project. The fifth section discusses the implications of the research findings and the last section concludes the paper.

4.2 Literature review

4.2.1 Development project sustainability and microfinance sustainability

IDPs are public development programmes or projects that are typically funded by donor institutions to address social and economic needs in developing countries (Ahsan & Gunawan 2010). They can be ‘hard’ or ‘soft’ projects (Youker 2003). However, they are generally never purely hard projects because of their goals and stakeholder roles (Golini & Landoni 2014). Golini and Landoni (2014) identify five common characteristics of development projects: lack of defined beneficiaries; excessive numbers of stakeholders; resource insufficiency; difficulty of project management application; intangible project outputs; and complex and difficult environments.

Sustainable development is defined by the Brundtland Commission of the United Nations in 1987 as ‘development that meets the needs of the present without compromising the ability of future generations to meet their own needs’. In the context of programme intervention, sustainability is defined as what happens after initial implementation (Stirman et al. 2012). Many international agencies and economists see project sustainability as the capacity of a project to continue to deliver its designated benefits over a long period of time (Bamberger & Cheema 1990). Scheirer (2005) considers that sustainability can be measured in three respects: the continuation of programme activities; outcomes or benefits; and maintenance of community capacity. Moore et al. (2017) lists five key elements of sustainability of development interventions: (1) a determined period of time, (2) continuous delivery of a programme, implementation strategy and/or clinical intervention, (3) sustaining of individual change, (4) evolution or adaptation of the programme and individual behaviour, and (5) continuous production of benefits.

Microfinance is defined as the provision of financial services to poor people, as well as the self-employed (Ledgerwood 1998). The main types of rural financial institution are institutional innovators, credit projects, credit unions, village banks, member-based institutions, solidarity credit groups and linkage types (Zeller 2006). A credit project is usually linked to, or part of, a larger (integrated) rural development programme. Many development projects establish RLFs through community-based financial organisations and expect that the funds will be repaid by the initial borrowers and recycled to other borrowers (Ritchie 2007). Microfinance sustainability can refer to several levels including individual, group and institutional, and can relate to financial, managerial and organisational aspects (Thapa 2006). MFI sustainability is defined as the ability of an MFI to cover all of its costs (Ritchie 2007) including expenditure from its revenues and to earn a profit and run without subsidies or donations from donor agencies or governments (Mahapatra & Dutta 2016).

The RLF project in Central Java Province, Indonesia, is a microfinance programme that was launched in 2007 and ended in 2015. However, the project continues to operate after its closure. The project was part of a national poverty alleviation programme, the PNPM Rural, a CDD project for rural areas managed by the central government. The project was financed by State Budget, the Regional Budget, and other donors. The microfinance programme (the RLF project) was implemented by AMUs, which then became MFIs at the sub-district level. There were more than 450 MFIs across Central Java Province, most of which have survived since project closure. The original AMUs (when the project implementation) were managed by a management committee responsible for daily activities and a board committee representing the community. Therefore, the AMUs were responsible to, obliged to report to, and supervised by, the government.

4.2.2 Project Sustainability by Using Complex System: A Theoretical Framework

A complex system is defined as ‘an ensemble of many elements which are interacting in a disordered way, resulting in robust organisation and memory’ (Ladyman et al. 2013). It can be described as having interdependent and interconnected elements and dimensions, feedback processes and emergence (Ramalingam 2008). The complexity of a project is measured by its interdependency and differentiation (Baccarini 1996). The humanitarian aid community is an open, complex and adaptive system (Seybolt 2009) involving multiple organisations, issues, relationships and motivations (Wu 2016). The complexity of a development project is determined by interrelated aspects, namely the nature of the intervention, stakeholders and institutions, causality and change, and the embeddedness and nature of the system (Raimondo et al. 2015). IDPs have diverse stakeholders (Diallo & Thuillier 2004). Their environment is unique and surrounded by economic, social, political, legal, cultural and geographic separation among actors (Hermano et al. 2013; Ika & Donnelly 2017). Additionally, the project demonstrates the

characteristics of a complex system including nonlinearity, connectedness, self-adaptation/self-organisation and emergence (Wu 2016).

Sustainability from a system perspective is ‘the ability of systems to persist, adapt, transform or transition in the face of constantly changing conditions’ (Williams et al. 2017), which results from dynamic and long-term maintenance of the system’s identity amid constant change (Gallopín 2003). A sustainable complex system is ‘one that is adaptive and self-organising, with its components free to coevolve in response to changes in each other and, as a whole, changing in response to external conditions’ (Innes & Booher 1999). Further, organisational sustainability happens within a complex system (Metcalf & Benn 2013). The sustainability of a system is determined by availability of resources, flexibility/adaptability, homeostasis, response capacity, self-reliance, empowerment (Gallopín 2003), adaptability, resilience/repair and evolvability (Mobus 2017). Moving towards sustainability can represent a significant form of organisational change, whether it is designed by leaders of the organisation or circumstances that allow, push or prevent organisations to move from one state to another (Greenwood et al. 2015). While the organisational change approach emphasises leaders’ roles, the institutional change approach stresses contextual circumstances (Greenwood et al. 2015). Change towards sustainability in dynamic and complex human–ecological systems is an endless process of transformation (Kemp et al. 2015).

Sustainability is a socially instituted process of adaptive change that can integrate with a transition management concept (Kemp et al. 2005). Transition management is a governance concept developed for managing sustainability transitions (de Gooyert et al. 2016). Sustainability transition is a multidimensional, long-term and fundamental transformation process towards a system’s shift to more sustainable production and consumption (Makard et al. 2012). This is an area of high complexity due to the many and varied interests and actors involved in transformation processes (Makard et al. 2012).

Espinosa and Porter (2011) detail six complexity principles in complex systems that define the dynamic operations responsible for the ability to adapt in unpredictable and nonlinear ways. These are nonlinear feedback, self-organisation, emergence, edge of chaos, co-evolution and path dependence. Williams et al. (2017) considers that the core theoretical concepts of complexity theory to understand sustainability involve IAFSE. The interconnectedness concept is associated with the connection of components within the system and the link between social, economic and ecological systems. Feedback is related to nonlinear dynamics and the emergence of complex behaviours over time that result from feedback mechanisms used for decision making. Adaptive capacity/resilience refers to the capability of agents to learn from their experience and act accordingly to ensure the survival of the system. Self-organisation is the ability of a system to develop its own structure and behave spontaneously in the face of change, to lead the system to sustainability. Emergence is related to lower-level interactions that result from new higher-level structures and patterns that lead to the system's sustainability. Since a microfinance programme and its sustainability are complex, a complex system approach is appropriate to understand the change and transition of the project towards becoming a sustainable project.

4.3 Methodology

This qualitative research used a case study. A qualitative research approach is important for understanding phenomena around promoting sustainability (Stirman et al. 2012). It is also appropriate for providing context-specific descriptions of organisational behaviour, which is nonlinear, historical and longitudinal (Svyantek & Brown 2000). Moreover, a case study can be used for 'disciplined-configurative' or 'interpretative' research where a researcher uses a theoretical foundation to investigate or interpret a case (Kaarbo & Beasley 1999).

Data collection involving document review, observations, interviews and FGDs was conducted from October 2019 to December 2020 in Central Java Province, Indonesia. The interviews and observations were preliminary data collection tools employed to understand the project and the operation of AMUs. The interviews involved eight respondents who were considered to understand the project, including AMU management committee members, AMU board committee members, local government officials and AMU association leaders. Observations were conducted in two MFIs. Further, three FGDs attended by a total of 73 participants were conducted: two at the district level (two districts) and one at the province level. The FGDs were attended by leaders of AMUs across the province, involving 52 MFI leaders from 27 districts.

Data were analysed using NVivo in two stages: identification of contextual circumstances and transition analysis. The first stage aimed to identify issues within the project by analysing institutional-level changes (Greenwood et al. 2015). This approach highlights the contextual circumstances that push, enable or prevent organisations moving from one state to another. In this study context, identification of contextual circumstances involved identifying issues that arose as a consequence of the project closure, which potentially challenged the sustainability of the project. The second stage aimed to analyse the transition towards a sustainable (surviving) project. It involved analysing the actions taken to address issues and linking these actions to sustainability of the project. The core theoretical concepts of IAFSE proposed by Williams et al. (2017) were adopted at this stage. NVivo software was used to identify issues within the project as a consequence of project closure, the actions taken to deal with them and the core theoretical concepts of complexity for sustainability. Results of the data analysis are presented in the following section.

4.4 Results

The microfinance programme was targeted to the productive poor; that is, those who have business activities, not the absolute poor. Every year, the government had provided grants to AMUs for distribution as loans to a group of borrowers. AMUs were providing microcredit and were not allowed to conduct other business activities. There were two types of loan: loans for productive poor women and loans for microenterprises. These loans were provided with easy access requirements such as not requiring collateral and no financial sanctions. However, a borrower group had to receive a recommendation from their village leader. Therefore, AMUs were dependent on the village leader to provide a list of borrowers rather than recruiting them. AMUs tended to perform a social function by distributing loans, rather than running a profitable business. The government provided subsidies to cover AMUs' operational costs.

When the government stopped funding for the microfinance, some critical aspects of the project changed, including aspects related to project ownership, project governance, accountability, the business model and marketing, which led to uncertainty and might affect the continuation of the project. The actions taken to cope with those challenges had the potential to enhance sustainability of the project. Details of these changes, the actions taken and an analysis of these phenomena in regard to sustainability of the project using a complex system approach are explained below.

4.4.1 Identification of the contextual circumstances

4.4.1.1 Governance

Since project closure, the project has become independent of the government and has no hierarchical organisational relationship with either the central or local government. No single body is formally governing the project at the district or province level. AMUs at the sub-district level are independent in the running of their activities according to

agreement from the community in the sub-district. To cope with this, an AMU association has been formally established to coordinate AMUs at province and district levels, and AMUs created coordination activities/function with the local government. Membership of the association is voluntary and every AMU acts independently. The association is a place for AMUs to share their mission, interests and information, and conduct mutual activities such as training, seminars, workshops and knowledge sharing. Sharing a mission with other AMUs may strengthen motivation and improve knowledge and skills to help in dealing with issues faced in the community. The association also functions as the representative of the AMU in the region in negotiations with other parties.

4.4.1.2 Accountability

Termination of the project has changed accountability mechanisms. Since the project ended, there is no obligation of AMUs to provide reports to any level of government, and the government provides no technical guidance or facilitators to assist the daily management of AMUs. There is also less surveillance from the government. To deal with these changes, AMUs have made agreements with their local government and the association to provide regular reports. Each AMU deals with its own daily challenges by employing local values and wisdom in its dealings with the community and enacting its organisational rules based on the community agreement. To increase accountability, AMUs use accounting software and independently hire external consultants or advisers, or external auditors.

4.4.1.3 Capital and Profitability

During the project implementation phase, the government was providing grants for new clients as well as additional capital. These grants led AMUs to focus less on generating revenue. Project closure meant these grants were stopped and AMUs must run

their business profitably. To cope with these changes, AMUs have developed a new business model to ensure more profitable business. AMUs now pay more attention to generating revenue without ignoring their social mission. While maintaining the social values of the project is important, since the project is an empowerment project owned by the community, earning a profit is vital to keep the business going. Therefore, AMUs have changed their business model from one providing a purely microcredit service to a hybrid business, by diversifying their business. They have begun to open new businesses such as grocery stores, and constructing and renting buildings; and have become goods and service providers and third party investors. To increase their capital, AMUs cooperate with other parties (including other AMUs), and to reduce any losses, AMUs have begun to apply self-insurance to their clients.

4.4.1.4 Competition

When in the project implementation phase, the government provided grants for microcredit and borrowers were recommended by village leaders based on grants allocated by the government; hence, there was little attention paid to the quality of borrowers. Moreover, no other institutions were providing microcredit like AMUs did. Therefore, AMU management did not pay any attention to competition. Since the project closure, AMUs no longer receive the grants and must ensure they can recruit qualified borrowers. Some financial institutions providing a similar credit mechanism (group-based microcredit) also have sprung up, which increases competition. To cope with this situation, AMUs have tightened the verification process without burdening borrowers with new requirements. AMUs have also employed marketing strategies such as providing rewards, subsidies for transportation costs and financial support for health issues. To improve service quality to increase client loyalty, AMUs have increased the credit limit. In addition, AMUs have reduced the required group size from five to three borrowers; cooperated with

community members to recruit new clients; and held social activities to remind the community that AMUs exist and to attract them.

4.4.1.5 Empowerment

Grants to conduct empowerment activities, such as capacity building for the community and management/board committee members of the AMUs, were provided during project implementation. However, when the project closed, the grants stopped, and these activities ceased. To address this change, AMUs have cooperated with villagers to conduct empowerment activities such as training and workshops for the community. Further, AMUs have facilitated the establishment of borrower associations, which are a place for borrowers to learn about the organisation and share knowledge. In addition, capacity building for management/board committee members of the AMUs is conducted by providing scholarships and cooperation with the AMU association and local government to provide trainings/workshops.

4.4.2 Transition analysis toward sustainable project

The phenomena described above represent the attributes of a complex system, such as interconnectedness, feedback, adaptive capability and self-organisation, and emergence, which are linked to the sustainability of the AMUs (MFIs). The detailed analysis is as follows.

4.4.2.1 Interconnections

Relationships among the elements in a complex system are very important for building connections and achieving desired goals. In this case, connections were built to address changes that would enhance sustainability of the project. Connections are made between AMUs, their stakeholders and other parties to achieve sustainability of the project.

These connections were built through sharing understanding, coordination and cooperation to develop similar views and agreement related to the sustainability of AMUs. Connections were also made with the government, other AMUs and AMU associations, and the community to build more support and share information, improve knowledge and strengthen the AMUs' position in the community. Through these connections, issues between AMUs and other parties could be resolved, and cooperation, agreement and support could be obtained that could lead to the continuous operation of AMUs.

4.4.2.2 Adaptive Capacity

Adaptation is essential to embrace change and build resilience, to ensure the survival of a project after its completion. AMUs' learning about the change of the project ownership and governance has made rules' establishment and adjustment within AMUs. Some AMUs registered their legal formal organisational form. Procedures within AMUs have been improved. Further, lack of accountability and control have forced AMUs to employ accounting software, and hire external consultants or advisers, or external auditors. The termination of government grants/subsidies caused AMUs to develop a new business model for more profitable business without discarding the project's values (social goals). Competition has driven AMUs to apply new marketing strategies. Those moves have helped protect AMUs' assets, provided AMUs with control over their business, added revenue and reduced costs for the AMUs, all of which support the continuous transition of AMUs towards becoming sustainable projects.

4.4.2.3 Feedback

Effective feedback mechanisms are crucial for a system as nonlinear dynamic behaviour over time that can inform decision making and enhances sustainability. Listening to customers may identify their needs and desires and improve their loyalty.

Seeking to understand the community needs and competition may provide information to improve service quality. All feedback is foundational for decision making to make adjustments that address current and future potential issues. In this way, AMUs can survive and continue their operations.

4.4.2.4 Self-organisation and Emergence

Developing their own structure and spontaneous behaviour without being guided from the top down to create emergent properties is important for AMUs in the project sustainability process. The formal establishment of AMU associations after the project ended was not ordered by the government but arose from an idea by AMU leaders. Therefore, instead of being coordinated by the government, AMUs in the province are now coordinated by associations in response to the closure of the project. Further, to survive, each AMU deals with its own issues by relying on local values and wisdom without direction from a top-down facilitator—the government. They also choose their own organisational structure based on their organisational form. Further, the existence of AMUs and AMU associations in the province is a result of self-organised actions towards becoming a sustainable project when the system (project) was forced out of equilibrium (project closure).

4.5 Discussion

4.5.1 Implication for microfinance sustainability management

This study reveals that a complex systems approach can be applied to analyse project sustainability. It explains how the project continues to perform after its implementation phase and provides an analysis of how to achieve this. The findings show that the process towards becoming a sustainable project is dynamic and has sustainable complex system attributes such as IAFSE. These have implications for microfinance

sustainability management and microfinance programme design. First, the results have implication for the importance of stakeholder management in project sustainability. Interconnectedness links parties that enable the project to move towards becoming sustainable. This may involve a mutual agreement to reduce barriers and strengthen support. To achieve sustainability, managers of complex systems need to understand interconnections (Williams et al. 2017). Effective connection requires effective stakeholder management. Stakeholder theory can contribute to sustainability through anchoring sustainability in the stakeholder mindset, and creating mutual sustainability interests and approaches (Hörisch et al. 2014). A sustainable project is influenced by external stakeholders through communication, complaints and legal actions, partnerships and capacity building, and direct action (Cvijović et al. 2021). Silvius and Schipper (2019) integrate project stakeholder management and sustainable development by proposing a tool to plan stakeholder engagement activities with consideration of sustainable development.

The second major implication of the findings is that there is a need for effective leadership. Seeking feedback from the environment and using it to improve decision making is important for achieving project sustainability. Information from stakeholders and the environment is useful for learning and decision making, making adjustments for addressing opposition and disagreements, and seeking mutual agreement and suggestions. Feedback offers sanctioned conversations across boundaries to increase learning in a sustainable complex system (Espinosa & Porter 2011). Feedback from the external environment can be responded to through adaptation or transformation, and has both direct and indirect effects on organisations (Williams et al. 2017). Adaptation is essential to embrace change and build resilience to ensure the survival of a project after implementation phase ends. Changes in the organisational form of AMUs, control mechanisms, marketing strategies and the business model demonstrate the adaptive

capacity of AMUs that might enhance their sustainability, and show that institutional-level changes towards sustainability occur. These changes emphasise contextual circumstances that push, enable or prevent organisations moving from one state to another (Greenwood et al. 2015). The adaptive capacity of a system is demonstrated when actors in the system can maintain the system's basic structure and manage resilience (Williams et al. 2017). Effective agent learning from their experiences and actions towards successful adaptation ensure survival of the system (Williams et al. 2017). Feedback and adaptive behaviours indicate the need for effective leadership to manage continuous changes. Leaders of organisations are important in the change process towards sustainability; they can either orchestrate or interpret and shape the change (Greenwood et al. 2015). Unit members will be able to quickly implement and refine new processes if the leader provides resources and direction (Caldwell et al. 2008). There is a positive relationship between sustainable leadership and sustainability performance (Burawat 2019).

Third, the results have implications for the importance of the governance system, especially a network-based governance system. Self-organisation and emergence are demonstrated by the actions of AMUs: for example, consideration of local values when dealing with issues; the organisational form of AMUs; and the formal organisational establishment of AMU associations that are not directed from the top down (i.e. by government). Such actions have been taken to help AMUs survive after project termination. Changes to the organisational form and establishment of associations imply the need for two types of system governance: system governance within AMUs to manage their daily activities; and higher-level system governance. The higher-level governing body must replace the function of government in coordinating AMUs after project closure, and tends towards network-based governance. This is because each AMU is independent of the association. Network-based governance promotes strong learning capacity and

adaptability in multilevel governance systems and is able to utilise changes in social, political and ecological contexts (Duit & Galaz 2008).

4.5.2 Implication for the design of microfinance programme

Other than the above implications for microfinance management, the findings have implications for the design of microfinance programmes. Since complex adaptive systems have strong tendencies to learn, adapt and self-organise (Rouse 2008), flexibility should be considered in a programme's design. The design should allow the system (programme) to redesign itself. Programmes that can be modified over time are likely to persist longer (Scheirer 2005). It is crucial for planning of a governing body for the programme/projects that consists of sub-projects/branches. This governing body will coordinate the project after the project closure. Accountability and control mechanisms that can be sustained after project closure are also important to prevent potential fraud. Another important design aspect is preparing and equipping the community with knowledge and skills as a basic skills to manage running the project after the project ends. This is critical as a sustainable project requires learning capacity and creativity. Hence, recruiting people who are dedicated and willing to learn is also important. Moreover, designing a programme that empowers and engages the community during implementation is important to create a sense of belonging to the project. This will be useful at the end of the project as it will be owned by the community as a public asset.

With reference to these findings, a model of sustainable microfinance projects (institutions) using a complex system approach is proposed (Figure 13). This model might be used as a reference for future management analysis and design for programme/project sustainability.

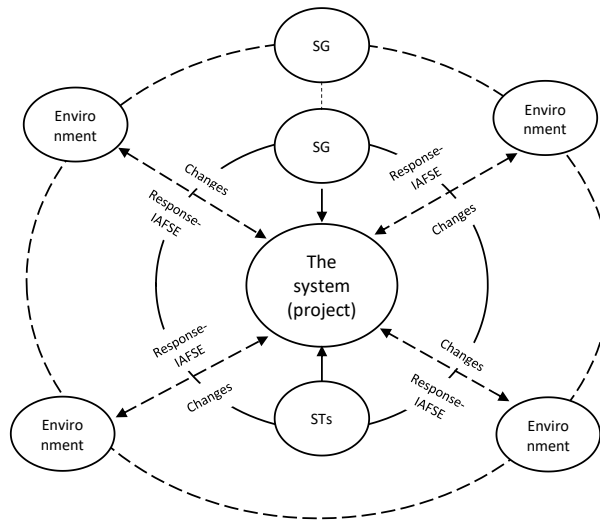


Figure 13: Model of sustainable microfinance programme by using complex system approach

A development project or programme is an open system that interacts with the environment. The environment is dynamic and changes in ways that might influence the project. The closure of a project produces change and causes issues that can hamper the continuous operation of the project after closure. To cope with environmental changes and to survive, the project should have the capacity to respond to changes effectively. Effective responses might be achieved by managing the project as a complex system to enable progress towards becoming a sustainable project. This involves characteristics of a complex system including IAFSE. Each component should be able to connect and interact with other elements in the system, especially its stakeholders and the environment. It should listen to and embrace the stakeholders and the environment to proceed and produce feedback for effective decision making. It should also be able to learn and adapt to make adjustments and create new ideas to address environmental changes. Further, the capacity to develop its own structure and behave spontaneously without being guided from the top down, which leads to emergent properties, is essential for survival of the project. Additionally, a system governance that tends towards network-based governance is required to provide more space for adaptation, self-organisation and emergence.

Therefore, effective stakeholder management, leadership and governance system are important to support the transition towards sustainability of the project.

4.5.3 Limitation of the study

This study has limitations that inform future research. The participant sample in this study was dominated by leaders of AMUs (MFIs); the involvement of more AMU stakeholders would improve robustness of the findings. The study applies to a specific case (one province); hence, conducting the research with a wider scope in the future is important. Using more comprehensive characteristics of a complex system to the analysis would provide more comprehensive analysis and information about project sustainability. Providing a detailed analysis of the relationships and dynamic interactions among AMU stakeholders would also be informative. Therefore, investigating the role of stakeholder and leadership theory in project sustainability is imperative. Finally, this study focuses on post-implementation; future studies should examine the implementation processes that might influence sustainability of the project, to provide a more comprehensive understanding of the phenomenon.

4.6 Conclusion

The demand for long-term effective IDPs' outputs/outcomes and the complexity of such projects led to the need for a comprehensive approach to increasing their sustainability. This study reveals that a complex system approach can be applied to understand the sustainability of microfinance projects. Analysis of changes that have occurred and transitions within the project enhances understanding of project sustainability. It identifies the problems raised after project termination and how to deal with them so that the project can continue to perform after the implementation phase; and

presents core concepts of complexity theory to understand the transition towards becoming a sustainable project.

In the microfinance project case study here, issues caused by the closure of the project include problems related to project governance, accountability, business model, competition and empowerment. Actions taken to cope with these issues included establishing an AMU association and agreement with local government; implementing organisational rules; employing accounting software; hiring external consultants or advisers or external auditors; developing a new business model; increasing capital; applying self-insurance; tightening up the verification process; running marketing strategies; cooperating with villagers and the AMU association to conduct empowerment activities; and facilitating establishment of a borrower association. Further, the analysis showed that the move towards becoming a sustainable project presents characteristics of a complex system including IAFSE. The findings have implications for microfinance sustainability management and microfinance programme design. First, they demonstrate the importance of effective stakeholder management, leadership and a network-based governance system. Second, they recommend including flexibility in programme design; planning a governing body; introducing accountability and control mechanisms after project completion; equipping the community with knowledge and skills; and recruiting the right people.

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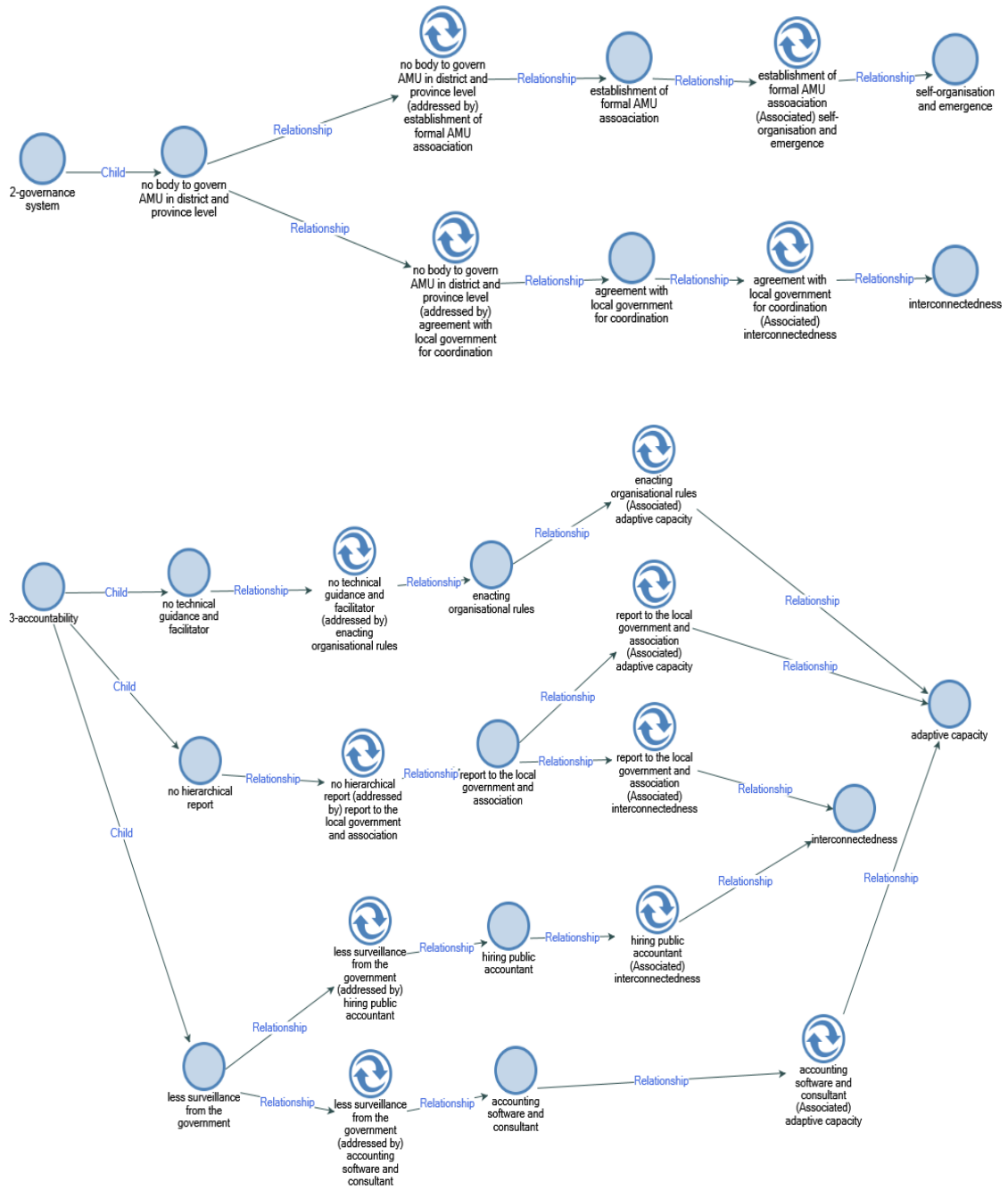
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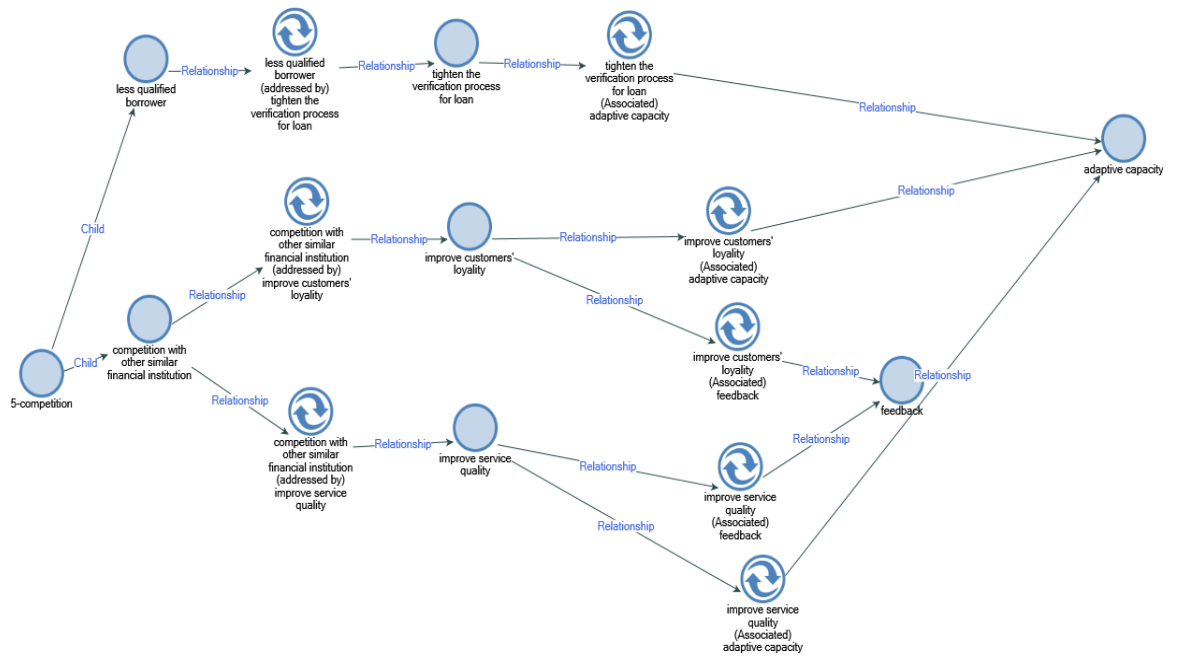
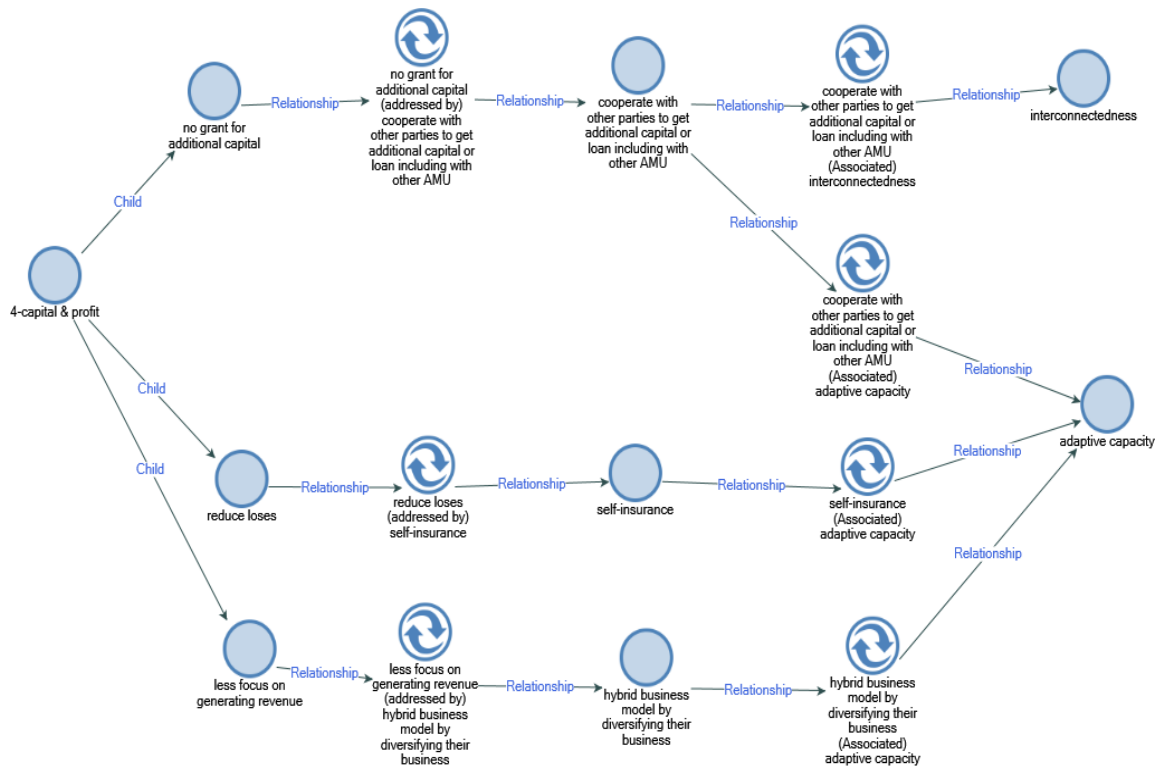
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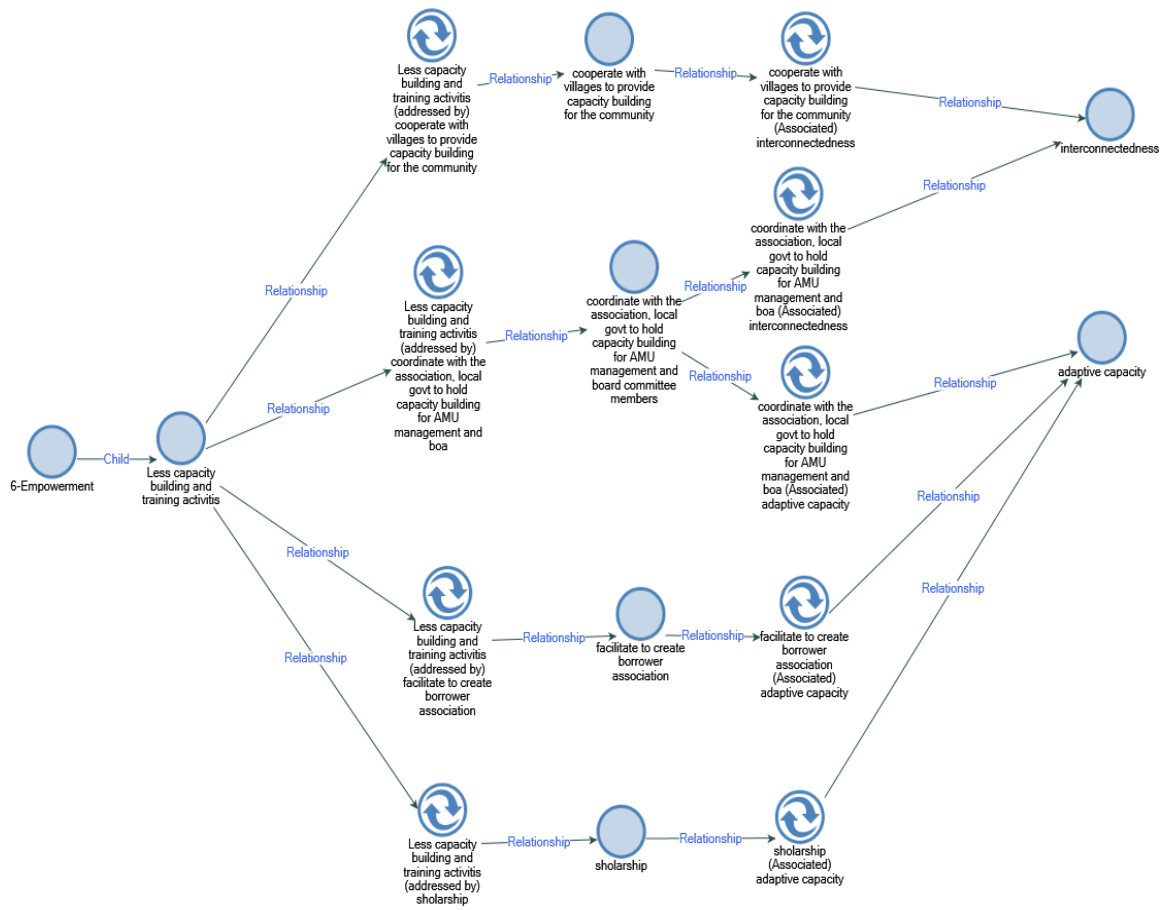
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Appendix

The analysis produced by NVivo







Chapter 5: Paper 4 - Exploring Factors Influencing the Sustainability of Project-Based Microfinance: A case Study in Revolving Loan Fund Project

This chapter presents the third part of the analysis that involved exploring the factors that influence the sustainability of the microfinance-RLF project in Central Java Province, Indonesia. The study was conducted based on the institutionalisation approach to project sustainability and the institutionalist view of microfinance sustainability, while considering project implementation aspects.

Statement of Authorship

Title of Paper	Exploring Factors Influencing the Sustainability of Project-Based Microfinance: A case Study in Revolving Loan Fund Project
Publication Status	<input type="checkbox"/> Published <input type="checkbox"/> Accepted for Publication <input checked="" type="checkbox"/> Submitted for Publication <input type="checkbox"/> Unpublished and Unsubmitted work written in manuscript style
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Principal Author

Name of Principal Author (Candidate)	Nurchasanah		
Contribution to the Paper	70% - Conducted the research, including literature review and theoretical framework, methodology design, data collection, data analysis, and theory development		
Overall percentage (%)	70%		
Certification:	This paper reports on original research I conducted during the period of my Higher Degree by Research candidature and is not subject to any obligations or contractual agreements with a third party that would constrain its inclusion in this thesis. I am the primary author of this paper.		
Signature		Date	04/04/2022

Co-Author Contributions

By signing the Statement of Authorship, each author certifies that:

- i. the candidate's stated contribution to the publication is accurate (as detailed above);
- ii. permission is granted for the candidate to include the publication in the thesis; and
- iii. the sum of all co-author contributions is equal to 100% less the candidate's stated contribution.

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Abstract

Ensuring the sustainability of development interventions such as microfinance programmes is essential for ensuring that finance is accessible to the poor in the long term. However, project-based microfinance often faces sustainability issues. Therefore, exploring the factors affecting the sustainability of such programmes is essential. Using the institutionalisation approach to project sustainability and the institutionalist view of microfinance sustainability, and considering project implementation aspects, this study aimed to explore the factors influencing the sustainability of project-based MFIs. A quantitative approach involving the use of statistical tools was used to analyse survey responses from 85 microfinance bankers from 65 MFIs. The results showed that project-based microfinance sustainability is influenced by project characteristics, local community support and project management. This implies that project implementation and its sustainability are concomitant. Project implementation that considers the local community and is supported by project management could have an important role in sustainability of the project. Further, developing sustainability strategies at the planning and implementation stages is crucial. Hence, IDP actors should take these into account.

Keywords: international development project, microfinance, sustainability factors

5.1 Introduction

IDPs such as microfinance are believed to be a crucial tool in addressing poverty around the globe. One popular tool used to eradicate poverty through microfinance and community development is the RLF. A RLF is an aspect of microfinance that provides microcredit to the poor. Sustainable microcredit is a potentially powerful poverty reduction tool that can offer permanent access to the poor so that they can increase their income, build assets and avoid external shocks (Helms 2006). This ensures the long-term benefits

of a project in helping reduce poverty and providing sustainable economic development (Chuanmin et al. 2012; Kankhva et al. 2016).

Unfortunately, the majority of community-based development projects face sustainability issues after funding institutions discontinue their financial support (Zayyanu et al. 2017), even when the implementation is a success (Stirman et al. 2012). Further, most (~70%) MFIs (Morduch 2000) are not sustainable (Dieckmann 2007) because of their dependence on donor subsidies to cover high operational costs (Hermes & Lensink 2011). Subsidised microfinance tend to lose focus quickly and be unsustainable (Brau & Woller 2004). This causes difficulties for rural MFIs to achieve progress in financial inclusion, compared with urban MFIs (Lopez & Winkler 2018). Achieving sustainability is challenging for rural MFIs (Thapa 2006) including community-managed RLFs (Cheng & Li 2009; Ritchie 2005) and credit projects (Zeller 2006). Additionally, issues of transferred assets, ownership, management and their conditions at the end of RLF projects play a significant role in the sustainability of RLF projects (European Commission 2008).

Project-based MFIs and RLF projects are initially development projects; therefore involving project implementation aspects in the sustainability of these MFIs is essential. Despite efforts to improve the sustainability of MFIs through exploring factors influencing it, research focused on exploring the sustainability of rural MFI projects that also consider project implementation factors is rare. It has been proposed that project implementation relates to sustainability (Pluye et al. 2004, 2005; Scheirer 2005; Shediak-Rizkallah & Bone 1998); however, research concentrating on sustainability in a project context is still nascent and fragmented (Aarseth et al. 2017). Further, despite increased efforts to integrate project management in sustainable development (Obradović et al. 2018), empirical evidence on this topic is also limited. Much literature on sustainability is theoretical and little guidance is available to sustain programme delivery, implementation strategies and outcomes (Moore et al. 2017). Hence, this study aimed to explore the factors that influence the

sustainability of project-based microfinance, in particular the RLF project in Central Java Province, Indonesia.

5.2 Literature Review

5.2.1 Project-based microfinance

IDPs are associated with public sector projects or programmes that are usually funded by donor agencies to address economic and social needs in developing countries (Ahsan & Gunawan 2010). The microfinance sector has been used in IDPs to address sustainable development for combating poverty. Microfinance is defined as financial services for the poor (CGAP 2002), via both formal and informal arrangements (Brau & Woller, 2004). Microfinancing is associated with an institution that offers financial inclusion to low-income clients through various services including microcredit, microsaving, microinsurance and money transfers (García-Pérez 2018). MFIs are considered hybrid organisations of different types (Marconatto et al. 2016). Project-based microfinance refers to credit projects as defined by Zeller (2006), namely rural MFIs established as part of a larger (integrated) development project and implemented by state development agencies or non-government organisations. RLF is an aspect of microfinance that refers to grants for communities to finance projects that provide loans with interest to the poor so that the funds can be revolved to other members (Ritchie 2005).

5.2.2 Sustainability in the context: Theoretical Lens

Sustainable development is defined by the Brundtland Commission of the United Nations in 1987 as ‘development that meets the needs of the present without compromising the ability of future generations to meet their own needs’. There is no agreement on the definition of project sustainability (Lennox et al. 2018; Shediak-Rizkallah & Bone 1998; Stirman et al. 2012). Silviu and Schipper (2014) discuss the dimensions of sustainability

in the project context, which involve balancing or harmonising economic, social and environmental interests; both short- and long-term orientation; values and ethics; local and global orientation; transparency and accountability; and consuming income rather than capital. This requires a shift from managing budget, time and quality to managing economic, social and environmental impacts and from delivering requested results to taking responsibility for sustainable development in organisations and society (Silvius & Schipper 2014). Therefore, project sustainability involves two aspects: temporary aspects of the project and long-term aspects of sustainability (Gilbert et al. 2012). The common definition of programme sustainability is ‘what happened after initial implementation’ (Stirman et al. 2012), and is associated with continuation, institutionalisation, maintenance, durability (Scheirer 2005) and follow-up over the long term (Braithwaite et al. 2020).

Sustainability in microfinance is related to the continuation of services for the poor. The comprehensive dimensions of microfinance sustainability have been proposed by García-Pérez et al. (2017) to involve economic, social, environmental and governance aspects. Since financial sustainability is critical for the continual existence of MFIs, research emphasis has been placed on this dimension (Churchill 2020; Gashayie & Singh 2015; Hermes & Lensink 2011; Morduch 2000). This aligns with the institutionalist paradigm of microfinance sustainability, which emphasises financial self-sustainability and institutional scale (Woller et al. 1999) through the capability of an MFI to cover its costs (CGAP 2002; Pollinger et al. 2007). Institutionalists claim that long-term service cannot be guaranteed if MFIs are not financially sustainable (Hermes & Lensink 2011). Therefore, institutional sustainability is key to successful microfinance (Brau & Woller 2004). In this study, sustainable project-based microfinance is associated with the existence of a microfinance project (MFI) after the initial implementation, when donor funding cease and the institution must cover its costs without receiving subsidies/donation.

5.2.3 Factors Affecting the Project Sustainability

Sustainability of development projects is affected by how the project is designed and implemented; how the project is organised; and external factors (Bamberger & Cheema 1990; Shediak-Rizkallah & Bone 1998). Since sustainability of a programme relates to routinised activities resulting from the programme (Pluye et al. 2004), project implementation is a parallel and concomitant process (Pluye et al. 2005). The preceding programme activities are likely to influence the sustainability of the programme (Scheirer 2005).

Factors related to a programme itself affect its sustainability (Ceptureanu et al. 2018). Demand for a programme intervention contribute to sustainability of the project (Senbeta & Shu 2019; Shediak-Rizkallah & Bone 1998). People's need increases community participation, which enhances project sustainability (Akinbile et al. 2006). The duration of the project and project type are proposed as determinants of project sustainability (Shediak-Rizkallah & Bone 1998). The availability of funding after project implementation also determines the sustainability of a project (Hailemariam et al. 2019; Penno et al. 2019; Sarriot et al. 2015; Savaya & Spiro 2012; Savaya et al. 2008; Shediak-Rizkallah & Bone 1998). Infrastructure and facilities also contribute to the sustainability of development programmes (Aksorn & Charoengam 2015; Greenberg et al. 2015; Penno et al. 2019).

Factors related to project management and technical aspects also contribute to sustainability of development projects (Bamberger & Cheema 1990; Kwak 2002; Sarriot et al. 2015). Ongoing technical support and human resources can determine the sustainability of community partnership projects (Bamberger & Cheema 1990; Greenberg et al. 2015). Education and training processes and capacity building also affect sustainability of these projects (Mahonge 2013; Penno et al. 2019; Shediak-Rizkallah &

Bone 1998; Stirman et al. 2012). Capacity and sustainability are considered interrelated through knowledge transfer (Hacker et al. 2012). Programme evaluation is another important factor in the sustainability of community-based programmes (Ceptureanu et al. 2018; Stirman et al. 2012). Silviu and Schipper (2014) consider that sustainability is related to transparency and accountability, which means that stakeholders are able to evaluate the organisation's activities and that the organisation is managed accountably. Better transparency and accountability can improve service delivery (Olukotun 2008) to enhance project sustainability (Bamberger & Cheema 1990). An exit strategy for a development project can also be seen as a strategy to enhance project sustainability (Lee 2017).

Other factors influencing the sustainability of development project, particularly community-based programmes are community specific, and include community participation, support, context, capacity (Ceptureanu et al. 2018) and ownership (Amazigo et al. 2007). Community participation (McConville & Mihelcic 2007) during a project's conception and implementation is important to sustain the project (Olukotun 2008; Shediak-Rizkallah & Bone 1998). Participation (Lyons et al. 2001) and a sense of community (Ahmad & Talib 2016) are related to empowerment, which enhances sustainability (Lyons et al. 2001). An empirical study reports a significant positive relationship between community empowerment and the sustainability of community-driven projects (Ahmad & Talib 2016). Active involvement of beneficiaries is one of the necessary conditions for project sustainability (Bamberger & Cheema 1990). Senbeta and Shu (2019) report that a community-managed project approach to empower communities in management and decision-making roles is significantly related to sustainable outcomes. Similarly, governance of MFIs is a mechanism that contributes significantly to their sustainability (Atahau et al. 2020; García-Pérez et al. 2017). Board members of MFIs (employees) are a significant predictor of MFI sustainability (Bakker et al. 2014).

5.3 The Revolving Loan Fund (microfinance) project in Indonesia (Central Java)

The RLF project in Indonesia is part of a CDD project for rural areas (PNPM programme) established in 2007 and concluding in 2015. It was the cooperation between international development agencies and the Indonesian government. The project was financed by State Budget, the Regional Budget, and other donors. The RLF project was managed by an AMU in every sub-district, which have since become MFIs. Each AMU committee consists of villagers who act as a board committee and management committee. Its mission was to provide microcredit mainly for productive poor women and microbusiness entrepreneurs in villages to provide empowerment and poverty reduction. There were more than 450 MFIs in the Central Java Province during project implementation and most were still in operation four years after project closure.

During project implementation, grants were provided by the government to finance microfinance activities. These grants included those for a revolving fund (small loans for poor villagers) and 2% operational costs for AMUs. However, when the project ended, both types of funding from the government ceased, so that the AMUs had to begin operating independently without subsidies/funds from the government.

5.4 Research Strategy and Methodology

This research is largely quantitative, and employs a case study design. However, to achieve its purposes, both a qualitative and a quantitative phase were included.

5.4.1 Qualitative phase

The qualitative stage began with a literature review of factors that influence the sustainability of IDPs and MFIs, to identify factors that may influence sustainability of project-based microfinance and develop questions for the survey questionnaire. To

conform with the project context, observations, interviews and a FGD were conducted with people experienced in the project, including AMUs management members, board committee members of the AMU association and a government officer. Seven participants were involved in this stage. Data collected from those activities were used to refine and develop a questionnaire for testing in the quantitative phase. Sixteen statements were developed for the survey questionnaire, as summarised in Table 4.

Table 4: Survey Questions

Code	Questions for the survey
ST1-BTNUP	The project that is a “button-up” project has influenced the continuation of the project
ST2-COMMNEED	The project that is needed and benefits the community has influenced the continuation of the project
ST3-PROJLENGTH	The length of the project has influenced the continuation of the project
ST4- FINAVL	The financial availability in the project closure has influenced the continuation of the project
ST5-TRAINING	Trainings provided during project implementation have influenced the continuation of the project
ST6-FCLTR	Availability of facilitators in the project implementation has influenced the continuation of the project
ST7-PROJMONEV	Project monitoring and evaluation during project implementation have influence the continuation of the project
ST8-PROJSPV	The direct supervision/surveillance from the government during the project implementation has influenced the continuation of the project
ST9-COMMITBORDMEM	Commitment of the board committee members of the MFIs has influenced the continuation of the project
ST10-TRANSRPT	The transparency of the MFIs report to the community has influenced the continuation of the project
ST11-COMMPARTI	The community’s participation in the MFIs has influenced the continuation of the project
ST12-COMMSENSE	The community’s sense of belonging to the MFIs has influenced the continuation of the project
ST13-GOVTSRPT	The support from the central government has influenced the continuation of the project
ST14-GOVREG	The regulation has influenced the continuation of the project
ST15-ECONINFL	Economic condition (rising prices of basic necessities) has influenced the continuation of the project
ST16-POL	Political situation has influenced the continuation of the project (such as election, change of leaders)

5.4.2 Quantitative phase

The study was conducted with 65 MFIs (AMUs) in the RLF project in nine districts in Central Java Province, Indonesia. The districts were selected based on their location and socio-economic factors (agricultural–manufacturing, manufacturing–agriculture and

manufacturing–trade). The survey was distributed among AMU bankers, including the board committee and management members of the AMUs. They were selected as participants in the survey because they were considered as people who understood the operation of the RLF project. A five-scale questionnaire from ‘strongly agree’ to ‘strongly disagree’ was delivered to the AMUs by email or face to face, which resulted in 85 valid returned questionnaires for further analysis. The data were analysed statistically. To identify ‘construct’ variables, factor analysis was conducted to explore the dimensions/factors that influenced the sustainability of project-based microfinance. Datasets that contain many variables can be reduced by observing ‘groups’ of variables (Yong & Pearce 2013). By using SPSS 27 and referring to Yong and Pearce (2013), Williams et al. (2010) and Costello and Osborne (2005), a factor analysis was performed, which first involved assessment of the suitability of the data for factor analysis on the basis of a correlation matrix, determinant scores, the Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy and Bartlett’s test of sphericity. This was followed by selection of an extraction method (principal components analysis), retention of factors according to Kaiser’s criterion (eigenvalue >1), selection of a rotation method (varimax), and interpretation and labelling.

The data suitability assessment determined whether the dataset was suitable for factor analysis. Multicollinearity was assessed via correlation (using a correlation metric >0.3) to understand the relationships between variables and enable calculation of a determinant score (>0.00001) (Yong & Pearce 2013). A significant Bartlett’s test of sphericity value ($p < 0.05$) was used to confirm the patterned relationship, and KMO values greater than 0.5 showed the data were suitable for factor analysis. A principal components analysis was applied for data extraction to decrease the large number of items to factors (Williams et al. 2010). The extraction approach employed Kaiser’s criterion (eigenvalue >1) to determine how many factors should be retained. A rotation aiming to

clarify and simplify the data structure (Costello & Osborne 2005) was applied using the varimax method. Finally labelling the retained factors which is theoretical, subjective and inductive (Williams et al. 2010) by naming them was applied. It is essential that labels/names/constructs reflect the conceptual and theoretical intent (Williams et al. 2010).

5.5 Result

5.5.1 Description of the MFIs (AMUs)

Sixty-five AMUs from 65 sub-districts in nine districts were involved in this study. Most (35%) had assets of 300,001–450,000 USD and 1000–2000 borrowers (40%); and 63% provided microcredit for tradespeople in the villages. Detailed data are provided in Table 5.

Table 5: Description of the AMUs

Variable	Category	Frequency	Percentage
Total asset*	<USD150,000	2	3%
	USD150,001 - USD300,000	15	23%
	USD300,001 - USD450,000	23	35%
	USD450,001 - USD600,000	12	18%
	USD600,001 - USD750,000	8	12%
	USD750,001 - USD900,0	3	5%
	Unstated	2	3%
	total		65
Number of borrowers	<1000	15	23%
	1001-2000	26	40%
	2001-3000	10	15%
	3001-4000	4	6%
	4001-5000	3	5%
	5001-6000	1	2%
	Unstated	6	9%
	total		65
Majority of the borrowers' occupation	Tradesperson	41	63%
	Farmer	13	20%
	Employee	7	11%
	Fisherman	1	2%
	Producer	1	2%
	Unstated	2	3%
	total		65

*1USD=IDR 14,000

5.5.2 Respondent profile

Eighty-five people participated in the survey. Most were aged 41–45 years and were male. Of the respondents, 65% had an undergraduate educational background, and most had more than 10 years of experience in AMU management and acting as a management committee member for an AMU. This information shows that the participants had sufficient and relevant experience in microfinance (RLF project) management. Information about the respondents is summarised in Table 6.

Table 6: Respondent profile

Variable	Category	Frequency	Percentage
Age (years)	26-30	6	7%
	31-35	17	20%
	36-40	18	21%
	41-45	20	24%
	46-50	12	14%
	51-55	8	9%
	56-60	3	4%
	>60	1	1%
		85	100%
Sex	Female	21	25%
	Male	64	75%
		85	100%
Position	Management	76	89%
	Board	9	11%
		85	100%
Experience (years)	3-4 years	6	7%
	5-6 years	9	11%
	7-8 years	5	6%
	9-10 years	22	26%
	>10 years	43	51%
		85	100%
Education	High school	13	15%
	Diploma	14	16%
	Undergraduate	55	65%
	Postgraduate	3	4%
		85	100%

5.5.3 Factor analysis

The data suitability assessment results are presented in Table 7. A correlation matrix showed that five items had low correlation coefficients, namely ST15-ECONINFL, ST14-GOVREG, ST16-POL, ST13-GOVTSPRT and ST6-FCLTR. These items were excluded, and the 11 remaining items used for further analysis. The determinant score was

0.008 (>0.00001), indicating a patterned relationship among the items and no issue of multicollinearity; therefore factor analysis could be applied. This was supported by a Bartlett's sphericity test value of 0.000 ($p < 0.05$) and KMO value of 0.710, which means the data were suitable for factor analysis.

Table 7: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.710
Bartlett's Test of Sphericity	Approx. Chi-Square	379.861
	df	55
	Sig.	0.000

Further analysis of the 11 items is presented in Table 8. By using the criterion of eigenvalue >1 and the scree test, the three most influential components were identified. The total variance explained by these constructs was 64.94%. Detailed results are presented in Appendix.

The first component explained 22.55% of the common variance and is considered the most important factor. These variables are related to project characteristics, including projects needed by the community, button-up projects, availability of financial resources and the length of the project. The items of 'projects needed by the community' and 'button-up project' were placed as the first and second elements, which demonstrates a relationship between project characteristics and the local community.

The second component includes community participation, transparency of MFI reports, community sense of belonging and commitment of committee board members. All these variables are related to the support of the local community for the project; hence they are termed local community support factors. This component explained only 21.77% of the variance, with the highest loading among the 11 variables being for the 'community participation' variable. This shows that active involvement of the local community is very important for sustainability of the project.

The third component consists of variables related to project monitoring and evaluation, direct supervision by government (surveillance) and training provided for MFI actors during project implementation. Those variables are related to project management aspects and thus are termed project management factors. This component explained 20.62% of the variance. Further, ‘project monitoring and evaluation’ had the highest loading among all items. This shows the importance of project management in a long-term successful project-based microfinance project.

Table 8: Factor Analysis Result

Construct/ component	Item		Rotated Component Matrix (a)	Total variance explained
Project characteristics	ST2-COMNEDD	Project needed by the community	0.792	22.552 %
	ST1-BTUP	Button-up project	0.777	
	ST4-FINAVAIL	Availability of financial source	0.674	
	ST3-PROJLENGTH	The length of the project has influenced the sustainability of the project	0.654	
Local community support	ST11-COMMPARTI	Community participation	0.928	21.766%
	ST10-TRANSRPT	Transparency of MFI report	0.706	
	ST9-COMMITBORDMEM	Commitment of committee board members	0.661	
	ST12-COMMSENSE	Community sense of belonging	0.598	
Project management	ST7-PROJMONEV	Project monitoring and evaluation	0.899	20.622%
	ST8-PROJSPV	Direct project supervision (surveillance) by the government	0.881	
	ST5-TRAINING	Training provided	0.612	
				64.941%

a. Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalisation.

5.6 Discussion

The three identified constructs show that sustainability of project-based microfinance is influenced by how the project is designed and implemented; how the

project is organised; and external factors, supporting the findings of Bamberger and Cheema (1990) and Shediak-Rizkallah and Bone (1998). Factors related to project implementation—especially the characteristics of projects that engage the local community and are supported by project management—seem to be crucial for sustainability of the project. This shows that the involvement of the community in project implementation leads to participation, empowerment and actions of the community towards sustainable projects.

Projects characterised by considering the local community are more likely to be sustainable. The community needs and bottom-up projects promoted community actions (participation) to sustain the project (Akinbile et al. 2006; Norberg et al. 2012), which included maintaining project resources (Olukotun 2008). The availability of resources is crucial to run the project. Therefore, the involvement of the community is essential to gain an understanding of community needs; and their involvement in project implementation supports long-term project existence. Further, longer projects seem to strengthen those actions for project sustainability. As Shediak-Rizkallah and Bone (1998) state, the duration of a project influences project sustainability.

Community support is essential for project sustainability. The results of this study support the finding of Ceptureanu et al. (2018) that community participation contributed significantly to the sustainability of a community-based programme. Community support is shown through participation in not only microcredit activities but also other activities, such as annual meetings, the AMU management accountability forum and other AMU social activities. These meetings not only discuss the report to ensure accountability but also consider future planning involving both AMU management and committee board members. The report and planning are open to the community and can influence them. Although AMU management members are employees, AMU committee board members are voluntary community representatives. One of the committee's duties is supervising the

management to ensure the MFI is running well to support its sustainability. Therefore, the commitment of the committee members is important for the continuation of the AMU. Further, a sense of belonging for the community seems lead to empowerment, as revealed by Ahmad and Talib's (2016) findings regarding participation and commitment of the community.

Aspects of project implementation such as project management also play an important role in project sustainability. Ensuring the AMUs is on track via monitoring, evaluation and supervision is likely to maintain the financial resources that are important for the continuation of the project. Knowledge transfer through training for community members who are important actors is also important to build common understanding, improve capacity, develop synergies, and improve participation and the sense of belonging. Programme evaluation, training and supervision also help in the development of strategies for sustainability (Ceptureanu et al. 2018; Stirman et al. 2012). This implies the significant role of project management in supporting project sustainability strategies. Therefore, it is important to include sustainability strategies in project planning, and then monitor, evaluate and supervise them. This finding informs the future research agenda on how project management can help incorporate sustainability into projects and organisations, as recommended by Marcelino-Sádaba (2015).

The current findings support those of Pluye et al. (2004, 2005) that programme implementation and programme sustainability processes are concomitant. Sustainability is influenced by all preceding programme activities (Scheirer 2005). Maintaining benefits achieved during project implementation is considered to have sustainable impact (Stirman et al. 2012). Although there is no guarantee that successful project implementation leads to project sustainability, project implementation that considers local community may play an important role in this. Hence, sustainability strategies that involve engaging local community in project design and implementation should be developed in project

implementation. The concept of sustainability influences how projects are managed and performed (Silvius & de Graaf 2019).

This study is not without limitations that could be addressed by future research. The research design could be improved by using more a comprehensive approach to project sustainability and microfinance sustainability. Further, future research could employ a larger sample size from a broader range of perspectives (local community including borrowers and society members, government, project managers and project donors), use pure random sampling, add more comprehensive variables (both independent and dependent variables) and employ more varied data analysis tools. Testing the detailed relationships among the variables and how they influence the sustainability of the programme would also be informative. To strengthen the impact of the study, it is encouraged that future research is conducted in a broader microfinance project, and potentially other IDPs.

5.7 Conclusion

Using the institutionalisation approach to project sustainability and the institutionalist view of microfinance sustainability, and considering project implementation aspects, this study aimed to explore the factors that influence sustainability of project-based MFIs. A quantitative approach using statistical tools was employed to analyse a survey responses from 85 microfinance bankers representing 65 MFIs (AMUs) from 65 sub-districts in 9 districts in Central Java Province, Indonesia. The findings contribute to knowledge by identifying three factors that influence the sustainability of project-based microfinance: project characteristics, local community support and project management. Factors related to project implementation—especially characteristics of projects supported by local community and project management—seem to contribute significantly to the sustainability of the project. They lead to involvement of the

community in project implementation, and thus community participation, empowerment and action towards a sustainable projects. This implies that project implementation and its sustainability are concomitant. Further, developing sustainability strategies during planning and implementation stages is crucial, and IDP actors should take this into account.

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Appendix

Correlation Matrix ^a												
		ST1-BTUP	ST2-COMMNEDD	ST3-PROJLENGTH	ST4-FINAVAIL	ST5-TRAINING	ST7-PROJMONEV	ST8-PROJSPV	ST9-COMMITBORDMEM	ST10-TRANSRPT	ST11-COMMPARTI	ST12-COMMSENSE
Correlation	ST1-BTUP	1.000	0.607	0.471	0.515	0.536	0.247	0.216	0.377	0.427	0.318	0.400
	ST2-COMMNEDD	0.607	1.000	0.311	0.444	0.164	0.105	0.127	0.358	0.304	0.161	0.264
	ST3-PROJLENGTH	0.471	0.311	1.000	0.378	0.388	0.228	0.123	0.319	0.258	0.148	0.358
	ST4-FINAVAIL	0.515	0.444	0.378	1.000	0.415	0.388	0.369	0.304	0.230	0.183	0.312
	ST5-TRAINING	0.536	0.164	0.388	0.415	1.000	0.541	0.437	0.431	0.429	0.287	0.319
	ST7-PROJMONEV	0.247	0.105	0.228	0.388	0.541	1.000	0.722	0.301	0.235	0.108	0.162
	ST8-PROJSPV	0.216	0.127	0.123	0.369	0.437	0.722	1.000	0.291	0.187	0.159	0.074
	ST9-COMMITBORDMEM	0.377	0.358	0.319	0.304	0.431	0.301	0.291	1.000	0.358	0.499	0.366
	ST10-TRANSRPT	0.427	0.304	0.258	0.230	0.429	0.235	0.187	0.358	1.000	0.597	0.210
	ST11-COMMPARTI	0.318	0.161	0.148	0.183	0.287	0.108	0.159	0.499	0.597	1.000	0.537
	ST12-COMMSENSE	0.400	0.264	0.358	0.312	0.319	0.162	0.074	0.366	0.210	0.537	1.000
Sig. (1-tailed)	ST1-BTUP		0.000	0.000	0.000	0.000	0.011	0.024	0.000	0.000	0.001	0.000
	ST2-COMMNEDD	0.000		0.002	0.000	0.067	0.170	0.123	0.000	0.002	0.071	0.007
	ST3-PROJLENGTH	0.000	0.002		0.000	0.000	0.018	0.131	0.001	0.008	0.088	0.000
	ST4-FINAVAIL	0.000	0.000	0.000		0.000	0.000	0.000	0.002	0.017	0.046	0.002
	ST5-TRAINING	0.000	0.067	0.000	0.000		0.000	0.000	0.000	0.000	0.004	0.001
	ST7-PROJMONEV	0.011	0.170	0.018	0.000	0.000		0.000	0.003	0.015	0.162	0.069
	ST8-PROJSPV	0.024	0.123	0.131	0.000	0.000	0.000		0.003	0.043	0.073	0.252
	ST9-COMMITBORDMEM	0.000	0.000	0.001	0.002	0.000	0.003	0.003		0.000	0.000	0.000
	ST10-TRANSRPT	0.000	0.002	0.008	0.017	0.000	0.015	0.043	0.000		0.000	0.027
	ST11-COMMPARTI	0.001	0.071	0.088	0.046	0.004	0.162	0.073	0.000	0.000		0.000
ST12-COMMSENSE	0.000	0.007	0.000	0.002	0.001	0.069	0.252	0.000	0.027	0.000		

a. Determinant = .008

Total Variance Explained									
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.325	39.321	39.321	4.325	39.321	39.321	2.481	22.553	22.553
2	1.579	14.351	53.672	1.579	14.351	53.672	2.394	21.767	44.319
3	1.240	11.269	64.941	1.240	11.269	64.941	2.268	20.622	64.941
4	0.845	7.682	72.623						
5	0.749	6.812	79.436						
6	0.614	5.585	85.021						
7	0.496	4.507	89.528						
8	0.456	4.143	93.671						
9	0.308	2.804	96.474						
10	0.225	2.041	98.515						
11	0.163	1.485	100.000						
Extraction Method: Principal Component Analysis.									

Rotated Component Matrix^a			
	Component		
	1	2	3
ST2-COMNEDD	0.792		
ST1-BTUP	0.777		
ST4-FINAVAIL	0.674		
ST3-PROJLENGTH	0.654		
ST11-COMMPARTI		0.928	
ST10-TRANSRPT		0.706	
ST9-COMMITBORDMEM		0.603	
ST12-COMMSENSE		0.598	

ST7-PROJMONEV			0.899
ST8-PROJSPV			0.881
ST5-TRAINING			0.612
Extraction Method: Principal Component Analysis.			
Rotation Method: Varimax with Kaiser Normalization.			
a. Rotation converged in 5 iterations.			

Chapter 6: Conclusion

6.1 Introduction

The large number of people living in poverty around the world, including in Indonesia, remains an important issue facing humanity. Although anti-poverty projects have been implemented, data still indicate a significant number of people living below the poverty line, indicating that dealing with poverty alleviation is challenging. Sustainable development projects that are expected to reduce poverty, including microfinance programmes, remain rare. Overall, IDPs performance is considered below acceptable levels given the amount of funds invested in such projects. Further, the literature shows that research on post-project sustainability has been limited and dominated by traditional linear approaches. With respect to microfinance sustainability, a number of studies have been conducted but few have employed complexity in their analysis. Most follow the institutionalist paradigm that emphasises financial sustainability. Therefore, by using quantitative and qualitative approaches, this study aimed to provide more comprehensive information on post-project sustainability by using a complex systems approach in a case study of the microfinance programme (RLF project) in Central Java, Indonesia.

6.2 Research findings

This research involved a comprehensive analysis of the post-project sustainability of a development project, namely the microfinance programme (RLF project) in Central Java Province, Indonesia. The findings are summarised in Table 9.

Table 9: Research Findings

Paper	Research question	Research findings
Paper 2	How can a complex system approach be used to evaluate project sustainability?	A complex system approach is applicable to post-project sustainability evaluation. A framework to evaluate post-project sustainability using a complex system approach is proposed.

		Application of the framework to the microfinance programme (RLF project) in Central Java Province, Indonesia revealed that the project is sustainable.
Paper 3	How can a complex system approach be used to understand sustainability of a development project (the RLF project)	<p>A complex system approach can be used to understand post-project sustainability evaluation.</p> <p>Some issues arose due to closure of the project, which include problems related to project governance, accountability, capital and profitability, competition and empowerment.</p> <p>Some actions were taken to address these issues, including establishing an AMU association; agreement with the local government and the association; employing local values/wisdom in approaches to the community; enacting organisational rules; employing accounting software and independently hiring external consultants or advisers, or external auditors; introducing a new business model to ensure more profitable business; cooperating with other parties; applying self-insurance; tightening up the verification process; employing marketing strategies; cooperating with villagers; facilitating the establishment of a borrower association; and implementing capacity-building activities.</p> <p>The move towards sustainable project presents characteristics of a complex system including IAFSE.</p>
Paper 4	What factors may influence the sustainability of the project?	Project-based microfinance sustainability is influenced by local project characteristics, community support and project management.

The results confirm that complex system approach is applicable for post-project sustainability analysis (paper 2 and 3). The second paper informs that two paradigm of microfinance sustainability could be synergized (programme can be sustainable without subsidies and can achieve financial and social goals) and sustainability and implementation are concomitant processes (paper 2 and 4). Furthermore, the third paper provides implications on project sustainability management and microfinance programme design. First, they show the importance of effective stakeholder management, leadership

and a network-based governance system. Second, they suggest flexibility should be included in programme design, planning of the governing body, accountability and control mechanisms after project completion, equipping the community with knowledge and skills, and recruiting the right people. Moreover, the third paper has implications on project implementation that should consider local community and project management, and develop sustainability strategies at the planning and implementation stages.

6.3 Research outcomes

The main outcome of this research is provision of a comprehensive analysis of post-project sustainability. Table 10 summarises all outcomes of the research.

Table 10: Research Outcomes

Research outcome	Paper
Definition of project sustainability and microfinance project sustainability from a complex system perspective	Paper 2
A post-project evaluation framework that provides comprehensive information about the sustainability of a project, including help to assess project sustainability dimensions and routinisation; the possibility of detecting ineffective or undesirable practices; information on how a project is governed after its implementation, as well as its performance, and persistence of practice and changes that have occurred in the project	Paper 2
Evidence that microfinance programmes can be sustainable without subsidies and achieve both financial and social goals, indicating that the two paradigms of microfinance sustainability can be synergised	Paper 2
Evidence on the importance of project design and implementation for project sustainability	Paper 2
Insight on the use of a complex system approach to evaluate and understand development project sustainability	Paper 2 & 3
A list of issues caused by the closure of the project and the actions taken to cope with those issues	Paper 3
Identification of the characteristics of complex systems, including IAFSE, in sustainable development projects	Paper 3
A model for sustainable microfinance projects (institutions) developed through use of a complex system approach	Paper 3

A list of factors that may influence the sustainability of microfinance programmes	Paper 4
Insight on the importance of engaging the local community and project management in the development of project sustainability (especially microfinance programmes)	Paper 4

6.4 Research contribution

This research provides rare empirical evidence regarding ex-post IDP (microfinance) sustainability. Through this study that uses a case study design with quantitative and qualitative approaches in a complex systems theory view, the sustainability of the project can be investigated. Information of the sustainability of the project including the degree (current state) of project sustainability, process toward a sustainable project and project sustainability factors were obtained. The project is considered as a sustainable project, its move towards a sustainable project presents characteristics of a complex system, including IAFSE, and its sustainability influenced by factors related to project characteristics, local community support and project management. Furthermore, the research contributes to knowledge enhancement on development project sustainability in general and microfinance programmes in particular. First, it provides a post-project sustainability evaluation framework developed using a complex system approach that offers a comprehensive evaluation and moves beyond static criteria on project outputs/performance. This may help to assess project sustainability dimensions and routinisation; introduces the possibility of detecting ineffective or undesirable practices; provides information on how a project is governed after its implementation, as well as its performance; and shows the persistence of practices and changes that have occurred in the project. Second, the research provides a model for managing development projects by using a complex system approach. This could be a novel approach to managing development projects towards sustainability. Third, the research ties theories such as stakeholder, leadership and governance theories to

development project sustainability. Fourth, the research identified problems arising in the microfinance programmes (the RLFs project in Central Java, Indonesia) following termination of the project. Hence, it contributes to practice and to the design and implementation of future microfinance programmes. Fifth, the study provides insight on the importance of engaging the local community and project management to development project sustainability (especially microfinance programmes). Finally, the research findings may be beneficial for governments and donors involved in the RLF project by informing them about the sustainability of the project, as shown in this study. They could use this study as a lesson learned for future policies and projects/programmes.

6.5 Limitation and future research

This research involves limitations and suggests future research. First, whole limitation of this research includes the use of a case study in a place (Central Java province, Indonesia) so that enlarging the case study sample by applying the framework to other areas, other types of IDP and many levels of organization is interesting. Furthermore, the main research participants are the leaders of AMUs in the province. Even though they are considered as the people who have good understanding on the project, broader involvement of other project stakeholders would enrich the result of the research.

Second, specific limitations which are related to specific paper and future research suggestions are described below. Paper 2, the evaluation framework does not provide risk on the project sustainability analysis. The framework focuses on the controllable components (outputs) and less intention on impact assessment. This study has limited access to the MFIs, the data mainly obtained by interview, FGD and report. Furthermore, future research can be conducted on analyzing the capability of a project to adapt and learn with changes toward a sustainable project. Investigating interaction among system

components/subsystems. Exploring the role and contribution of individuals or stakeholders in making a system sustainable. Examining the main characteristics or attributes of complexity possessed by a project that leads the project to a sustainable project (addressed in paper 3). Measuring the effect and contribution of the sustainable project to community sustainability and sustainable development (impact assessment). Exploring factors that influence a project toward a sustainable project (addressed in paper 4). Investigating model of the project implementation that can lead to a sustainable project (addressed in paper 3). Finally, exploring the most appropriate supporting policy taken by the government to ensure the sustainability of the project is also crucial.

Paper 3, providing details analysis of the relations and dynamic interactions of the MFIs' stakeholders would be interesting. Therefore, investigating the role of stakeholder and leadership theory to project sustainability would be imperative. Finally, this study focuses on post-implementation, hence it would be more comprehensive if future study also looks at the implementation processes that could influence the sustainability of the project.

Paper 4, the research design could be improved by using more comprehensive approach on project sustainability and microfinance sustainability. Furthermore, the future research could enlarge sample size from varied perspectives (local community including borrowers and the society members, government, project managers, project donors), use pure random sampling, add more comprehensive variables (both independent and dependent variables), and employ more varied data analysis tools. Testing the details relation amongst the variables and how the factors influence the sustainability of the programme are also impressive for future research.

Appendices

Appendix 1: Ethics approval

Our reference 33839

09 August 2019

Associate Professor Indra Gunawan
Entrepreneurship, Commercialisation and Innovation Centre

Dear Associate Professor Gunawan

ETHICS APPROVAL No: H-2019-147
PROJECT TITLE: Post-project sustainability analysis using a complex systems approach

The ethics application for the above project has been reviewed by the Low Risk Human Research Ethics Review Group (Faculty of Arts and Faculty of the Professions) and is deemed to meet the requirements of the *National Statement on Ethical Conduct in Human Research 2007 (Updated 2018)* involving no more than low risk for research participants.

You are authorised to commence your research on: 09/08/2019

The ethics expiry date for this project is: 31/08/2022

NAMED INVESTIGATORS:

Chief Investigator: Associate Professor Indra Gunawan
Student - Postgraduate Doctorate by Research (PhD): Ms Nurchasanah .
Associate Investigator: Dr Sam Baroudi

CONDITIONS OF APPROVAL: Thank you for your considered responses to the matters raised. The revised application provided on 09/08/19 has been granted approval.

Ethics approval is granted for three years and is subject to satisfactory annual reporting. The form titled Annual Report on Project Status is to be used when reporting annual progress and project completion and can be downloaded at <http://www.adelaide.edu.au/research-services/oreci/human/reporting/>. Prior to expiry, ethics approval may be extended for a further period.

Participants in the study are to be given a copy of the information sheet and the signed consent form to retain. It is also a condition of approval that you immediately report anything which might warrant review of ethical approval including:

- serious or unexpected adverse effects on participants,
- previously unforeseen events which might affect continued ethical acceptability of the project,
- proposed changes to the protocol or project investigators; and
- the project is discontinued before the expected date of completion.

Yours sincerely,

Dr Anna Olijnyk Dr Douglas Bardsley
Convenor Convenor

The University of Adelaide



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Appendix 2: Post-project sustainability evaluation of the RLF project in the Tegal district, Central Java, Indonesia

Stage 1: defining the working definition of the system under consideration and its sustainability

Definition of post-project sustainability	The existence of a project after its initial implementation and the conformity its operation to SDGs.
Definition of post-project sustainability in the context of microfinance project	A microfinance project exists after the initial implementation on, can cover its costs without eliminating social mission and not contradicting with SDGs.
System under consideration	The RLF (microfinance) project ex PNPM community-based project in the Tegal district, Central Java, Indonesia.
The system sustainability definition and its evaluation	Project sustainability is defined as the existence of the project after its implementation by looking at the system's components to generate and or to maintain designated outputs/outcomes for achieving the desired mission. The evaluation of the sustainability of the project would be assessed through assessing the system's components including the system's components (input, process, output, system governance and feedback mechanism) to achieve its goal (mission).
The time frame of the evaluation	4 years after the project completion (2018)
System level and unit analysis	The system level analysis is in project level and the unit analysis is a group of MFIs in Tegal district.
Criteria	The existence is measured by the existence of mission, input, process, output, system governance and feedback mechanism.
	Performance is measure by financial (OSS, ROA,ROE,PAR), social (breath and depth outreach and environmental awareness)
Baseline criteria	Existence and performance of the project at the end of the project implementation (2014).

Stage 2: assessing the system's existence (current)

Elements	Explanation	
The system	The RLF (MFI) project ex PNPM community-based project in the Tegal district, Central Java, Indonesia	
Mission	To empower the villager and to alleviate poverty by providing microcredit (with easy requirement)	
Essential input	Financial	Cash, loan, payable. All financial resource is sourced by AMU (from profit) without subsidy from the government
	Human resources	AMU committee members, AMU staffs, AMU governance board members
	Assets	Supplies, equipment, car, building
	Clients	Borrowing group members (women and microbusiness) Targeted client (productive poor) Requirement (easy requirement)

Essential process	Meeting	Internal meeting (AMU meeting, intervillage meeting, borrower meeting, External meeting (meeting with the local government, with AMU association, and with other institutions)
	Loan processing	The process from application, assessment, approval, and transferring loan to clients
	Lending group supervision	Supervise the lending group members who face problems in their group
Output	Loan	Special fund for women, fund for microbusiness
	Social fund	Fund provided for developing the community
	Institutional development fund	Fund provided for developing AMU's governance board member/lending group members
	Lending group development	An organization called "Paguyuban" that manage by borrowers has been establish for developing the borrower
		Activities: Providing loan to villagers through group-based lending, providing capacity building for the MFI's committee board members and borrowers, providing social fund for the community development
	Other business activities	Some AMUs begin to open a new profitable business other than microcredit such as minimarket, venue rental business and goods provider for the government
System governance	Ownership	Each AMU is owned by community in each sub-district
	Organizational structure:	The organizational structure is determined by the community through intervillage meeting. Therefore, AMU is independent from the government and led by AMU's governance board member with the highest authority at the intervillage meeting. Furthermore, AMUs in the district are coordinated by AMU association in the province level.
	Reporting and surveillance	Mandatory report to intervillage meeting Other reports send to the local government and AMU association Formal and regular surveillance from the government and international agency
	Stakeholder	Internal: AMU committee members, AMU staffs, AMU governance board members, borrowers, External: local government, AMU association, broader community, other institutions
	Essential sub systems	Borrowing system, human resources system, financial system, accountability system, surveillance system
Boundary	Activity scope	Providing microloan is for women and microbusiness with easy requirement and trying to run other type of profitable business
	Organizational characteristic	Non-profit oriented organization but generating income in order to sustain the activities
	Geographical service area	Every AMU only serves for community in its subdistrict
	Authority	AMU are independent from the government and the highest authority is at intervillage meeting so that all decision is freely taken as long as approved in the intervillage meeting.

	Government rule	AMU only provides credit for villagers, it is not categorized as a bank
	Organizational value and principle	AMU applies mutual cooperation value and local value
Feedback mechanism	Meetings, report, visit	Internal: Feedback can be from the governance board members, the borrowers, intervillage meeting members External: Feedback can be from broader community member, the government, the AMU association, independent auditor/financial consultant, other institutions
Environment	Essential environment	Economic system (Banking and financial system), Social system (Believe and culture system), Political system (Government (national and local))

Stage 3: assessing the system performance (Average in the district)

Criteria	Explanation	Measure	Current performance (2018)
Financial			
Related to the financial capacity of MFIs			
Total asset	Total asset owned by the 13 AMUs	Total asset based on financial report of the 13 AMUs	IDR 71,783,585,171.64
Operational Self-Sufficiency (OSS)	It shows how well the MFI can cover its costs through its revenue.	Total revenue divided by total cost Criteria: OSS >100%	2.42
Return on Asset (ROA)	It shows how well an MFI is managing its assets to optimize its profitability.	Total revenue divided by total asset/average asset Criteria: ROA > 0	0.10
PAR (portfolio at risk)	it shows the potential for future losses based on the current performance of the loan portfolio.	PAR >30 days divided by total loan Criteria: PAR < 10%* *with write-offs	0.20
Social			
related to the social mission of MFIs			
Outreach (breadth)	Number of clients served	Number of clients served	18,474 people
Outreach (Depth)	The poverty level of clients served	Total loan divided by total clients	IDR 3,312,699
Interest rate	provisions regarding loan interest	<= market rate; the agreement of Intervillage Forum	<= market rate; the agreement of Intervillage Forum; The average interest rate is 18%
Loan requirement	Requirements must be fulfilled by the borrower	Productive poor especially women or microentrepreneur, villager in the sub-district, group-based lending, no collateral, no administration fee	no collateral, no administration fee,

Borrower development fund	Funds allocated from profit for borrower development	Based on the profit earned and the agreement of Intervillage Forum, AMU allocates fund for borrower development	MFI allocated refreshment fund based on the profit earned and agreement of intervillage meeting
Community development fund	Funds allocated from profit for community development	Based on the profit earned and the agreement of Intervillage Forum, AMU allocates fund for community development	MFI allocated social fund based on the profit earned and agreement of intervillage meeting
Institutional fund	Funds allocated from profit for development MFI's committee board member	Based on the profit earned and the agreement of Intervillage Forum, AMU allocates fund for institutional development	MFI allocated institutional fund based on the profit earned and agreement of intervillage meeting
Environmental awareness	This is measured by whether the MFI has rules (normative-informal/detail-formal) related to environmental protection	AMU has rules (normative-informal) related to environmental protection	92% of the MFIs have normative-informal rule about environmental protection by following the rule in the guidance of initial project implementation.

Stage 4: Determine/assess the sustainability of the project

System's components	Status	Base line (end of project implementation)	Current		Explanation
System components					
Mission	Exist	To empower the villager and to alleviate poverty by providing microcredit (with easy requirement)	To empower the villager and to alleviate poverty by providing microcredit (with easy requirement)	Not change	
	Exist	Organizational characteristic: pure non-profit oriented organization through fund provided by the government	Organizational characteristic: generating profit to run the activities for achieving its mission	Change	Due to no funding from the government or the donor agencies, the source of finance depends on the profit earned. However, the MFIs notice that they are not allowed to increase the interest rate.
Essential inputs	Exist	Financial (mainly sourced from the government's subsidy) Assets (supplies, equipment, car, building)	Financial (mainly sourced from profit)	Change	Since the project was closed the AMUs are no longer receive grant from the government. Therefore, the AMUs have relied on loan repayment.
	Exist	Assets (supplies, equipment, car, building)	Assets (supplies, equipment, car, building)	Not change	
	Exist	Human resources (AMU committee members, AMU staffs, AMU governance board members)	Human resources (AMU committee members, AMU staffs, AMU governance board members)	Not change	
	Exist	Loan applications/borrowers (Borrowing group members: women and microbusiness, targeted client (productive	Loan applications/borrowers (Borrowing group members: women and microbusiness, targeted client (productive poor), with easy requirement)	Not change	

		poor), with easy requirement)			
Essential process	Exist	Loan processing (the process from application, assessment, approval, and transferring loan to clients)	Loan processing (the process from application, assessment, approval, and transferring loan to clients)	Not change	
	Exist	Internal meeting (AMU meeting, intervillage meeting, borrower meeting) External meeting (meeting with the local government (mandatory), with AMU association, and with other institutions)	Internal meeting (AMU meeting, intervillage meeting, borrower meeting) External meeting (meeting with the local government (not mandatory), with AMU association, and with other institutions)	Change	The project completion made the project independent from the government, therefore there are not mandatory meetings with the government and facilitators
	Exist	Supervise the lending group members who face problems in their group	Supervise the lending group members who face problems in their group	Not change	
	Exist	Report to the government and to intervillage meeting	Mandatory report to intervillage meeting	Change	After the project completion, the AMUs are not mandatory to report to the government
Output	Exist	Loan (special loan fund for women and microbusiness)	Loan (special loan fund for women and microbusiness)	Not change	
	Exist	Social fund (provided for developing the community, minimum 15% of profit)	Social fund (provided for developing the community, minimum 15% of profit)	Not change	
	Exist	Institutional fund (provided for developing AMU institution, maximum 35% of profit)	Institutional fund (provided for developing AMU institution, maximum 35% of profit)	Not change	
	Exist	Trainings for AMU's governance board member/lending group members were provided	Trainings for AMU's governance board member/lending group members are provided	Not change	

System governance	Exist	Ownership (during the project implementation, the project is owned by the government)	Ownership (each AMU is owned by community in the sub-district)	Change	After the project completion the project is owned by the community in the sub-district
	Exist	The organizational structure is determined by the government. Therefore, AMU is not independent from the government.	The organizational structure is determined by the community through intervillage meeting. Therefore, AMU is independent from the government and led by AMU's governance board member with the highest authority at the intervillage meeting. Furthermore, AMUs in the district are coordinated by AMU association.	Change	After the project completion, the project is not part of the government project and determined by the community. The AMUs coordinate with the government and AMU association
	Exist	Internal stakeholder: AMU committee members, AMU staffs, AMU governance board members, borrowers, project facilitators, the government External: broader community, other institutions	Internal stakeholder: AMU committee members, AMU staffs, AMU governance board members, borrowers, External stakeholder: local government, association, broader community, other institutions	Change	After the project completion, there are no facilitators and the government become external stakeholders
	Exist	Subsystem (Borrowing system, human resources system, financial system, accountability system, surveillance system)	Subsystem (Borrowing system, human resources system, financial system, accountability system, surveillance system)	Not change	
Boundary	Exist	Activity scope: Providing microloan is for women and	Activity scope: Providing microloan is for women and	Not change	

		microbusiness with easy requirement	microbusiness with easy requirement		
	Exist	Geographical service area: Every AMU only serves for community in its subdistrict	Geographical service area: Every AMU only serves for community in its subdistrict	Not change	
	Exist	Authority: AMU is a part of the government's project. The decision must be approved by intervillage meeting and the government.	Authority: AMU are independent from the government and the highest authority is at intervillage meeting so that all decision is freely taken as long as approved in the intervillage meeting.	Change	After the project completion the AMUs are independent to the government
	Exist	Government rule: AMU only provides credit for villagers, it is not categorized as a bank	Government rule: AMU only provides credit for villagers, it is not categorized as a bank	Not change	
	Exist	Organizational value and principle: AMU applied mutual cooperation value and local value	Organizational value and principle: AMU applies mutual cooperation value and local value	Not change	
Feedback mechanism	Exist	Internal feedback: feedback can be from the government through regular monitoring and evaluation, the project facilitators, governance board members, the borrowers, intervillage meeting members	Internal feedback: feedback can be from the governance board members, the borrowers, intervillage meeting members	Change	After the project completion, there are no regular monitoring and evaluation activities from the government
	Exist	External feedback can be from broader community member, other institutions	External feedback can be from broader community member, the government, the AMU association, independent	Change	After the project completion, private independent auditor/financial consultant is invited

			auditor/financial consultant, other institutions		
Environment	Exist	Economic system (Banking and financial system), Social system (Believe and culture system), Political system (Government (national and local))	Economic system (Banking and financial system), Social system (Believe and culture system), Political system (Government (national and local))	Not change	

The project performance

System's components/performance	Baseline (end of project implementation)	Current	Minimum criteria		Explanation
Performance (average)					
Financial dimension					
Total asset	IDR 71,783,585,172	IDR 91,743,532,045	=> baseline	Change	Total assets are increase due to profit earned by the AMUs
OSS	3.33	2.42	>1; = baseline	Change	The costs increase due to no longer subsidy from the government
ROA	0.11	0.10	>0; = baseline;		
PAR	0.22	0.20	<0.1; = baseline	Change	After the project completion, the AMUs' board committee focus on managing microfinance activity, more intensive supervision to the borrowers is conducted. However, some AMUs have not applied write-offs policy.
Social dimension					
Outreach (breadth)	20,484 people	18,474 people	= baseline	Change	Grant provided when the project implantation and the target to spend the grant had made fund allocated for loan was larger. Furthermore, the application approval process was lax so that more borrowers were recruited; conversely less funds are available, more stringent on the application approval are

					applied after the project completion; the limited business coverage; service competitions with other financial services.
Outreach (depth)	IDR 2,026,527	IDR 3,312,699	= baseline	Change	Most of the borrowers are not the new borrowers but who have borrowed for a long time so that they increase their loans gradually; competition with other financial services; the reduction of the number of borrower
Interest rate	<= market rate; the agreement of Intervillage Forum	<= market rate; the agreement of Intervillage Forum	= baseline	Not change	
Loan requirement	Productive poor especially women or microentrepreneur, villager in the sub-district, group-based lending, no collateral, no administration fee	Productive poor especially women or microentrepreneur, villager in the sub-district, group-based lending, no collateral, no administration fee	= baseline	Not change	
Borrower development fund	Based on the profit earned and the agreement of Intervillage Forum, AMU allocates fund for borrower development	Based on the profit earned and the agreement of Intervillage Forum, AMU allocates fund for borrower development	= baseline	Not change	
Community development fund	Based on the profit earned and the agreement of Intervillage	Based on the profit earned and the agreement of Intervillage Forum,	= baseline	Not change	

	Forum, AMU allocates fund for community development	AMU allocates fund for community development			
Institutional fund	Based on the profit earned and the agreement of Intervillage Forum, AMU allocates fund for institutional development	Based on the profit earned and the agreement of Intervillage Forum, AMU allocates fund for institutional development	= baseline	Not change	
Environmental awareness	AMU has rules (normative-informal) related to environmental protection	AMU has rules (normative-informal) related to environmental protection	= baseline	Not change	

