

Adaptation to Climate Change:  
The Attitude and Behaviour of Rice Farmers  
in the Mekong Delta, Vietnam

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## **Abstract**

Adaptation to climate change is a critical issue to many developing economies. The issue is particularly important to agriculture, a sector relying substantially on climate-sensitive resources. However, understanding of adaptation is limited in Southeast Asian contexts, including Vietnam. This thesis, therefore, investigates the attitude and behaviour of rice farmers in the Mekong Delta, a major agricultural region of Vietnam, in response to climate change.

The thesis is guided by an integrated conceptual framework that was predominantly developed from protection motivation theory. The framework incorporates socio-economic and psychological factors to explain farmers' adaptation intentions and behaviours to climate change. Focus group discussions and agricultural officer interviews generated insights into the research context and supplemented the questionnaire design. A structured questionnaire was used to interview 600 randomly chosen rice farmers in the three selected provinces in the Mekong Delta. Those provinces were identified as highly, moderately, and mildly vulnerable to climate change.

The focus group discussions and agricultural officer interviews indicated that farmers were aware of climate change. However, they had limited knowledge of the importance of adaptation to their livelihoods. Barriers to farmers' adaptation were not exclusively limited to economic factors and resource constraints. Some psychological factors also hindered adaptation (e.g. maladaptation, habit, and perception). There were differences in the perspectives of farmers and agricultural officers regarding barriers to farmers' adaptation. This indicates some of the complexity and importance of understanding the actual barriers to farmers' adaptation.

Multiple regressions highlight that risk experience, information, belief in climate change, and trust in public adaptation influenced perceived risks of climate change to one or more dimensions of farmers' lives (e.g. physical health, finance, production, social relationships, and psychology) and overall perceived risk. This presents policy implications for the quality, timing and channels of information about climate change, as they shape farmers' perceptions of climate change risk significantly.

Farmers' adaptation assessments were represented by perceived self-efficacy, perceived adaptation efficacy and perceived adaptation cost. Multiple regressions helped

to understand significant factors influencing those assessments. Those factors were demographic and socio-economic factors, belief in climate change, information, and objective resources. It is advisable to pay attention to the sources and quality of information; and improve the accessibility and usefulness of local services (e.g. agricultural extension, credit, irrigation, market, education, and health care).

Structural equation modelling reveals that farmers' intention to adapt to climate change was significantly influenced by farmers' perceived risks of climate change, farmers' adaptation assessments, maladaptation, disincentives and the subjective norm. Multi-group analysis helped identify factors influencing adaptation intentions to climate change in each of the three provinces at high, moderate or mild vulnerability levels. The findings suggest that attention should be paid to the characteristics of each province and the corresponding significant factors in planning adaptation.

The thesis offers an improved understanding of farmers' private adaptation to climate change. It demonstrates that protection motivation theory, a major theory in health risk studies, is useful in research into adaptation to climate change. Important policy implications were drawn for effective adaptation strategies.

## 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.

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## Publications arising from this thesis

Dang, LH, Li, E & Bruwer, J 2012, 'Understanding climate change adaptive behaviour of farmers: An integrated conceptual framework'. *The International Journal of Climate Change: Impacts and Responses*, vol.3, iss.2, pp.255-272.

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## List of abbreviations

ADB	Asian Development Bank
AGFI	Adjusted goodness-of-fit index
AOIs	Agricultural officer interviews
AVE	Average variance extracted
CAT	Coding analysis toolkit
CB-SEM	Covariance-based structural equation modelling
CFA	Confirmatory factor analysis
CFI	Comparative fit index
CR	Construct reliability
DARD	Department of Agriculture and Rural Development
FGDs	Focus group discussions
GDP	Gross Domestic Product
GFI	Goodness-of-fit index
GOF	Goodness-of-fit
GSO	General Statistics Office of Vietnam
IMHEN	Vietnam Institute of Meteorology, Hydrology and Environment
IPCC	Intergovernmental Panel on Climate Change
MD	Mekong Delta
MIT	Ministry of Industry and Trade
MONRE	Ministry of Natural Resources and Environment
MRC	Mekong River Commission
NCHMF	National Centre for Hydro-Meteorological Forecasting of Vietnam
NFI	Normed fit index
NNFI	Non-normed fit index
OCHA	Coordination Humanitarian Affairs

PGFI	Parsimonious goodness-of-fit index
PLS-SEM	Partial least squares structural equation modelling
PMT	Protection motivation theory
PNFI	Parsimony normed fit index
RMR	Root mean square residual
RMSEA	Root mean square error of approximation
RNI	Relative non-centrality index
R <sup>2</sup>	R-square
SD	Standard deviation
SE	Standard error
SEM	Structural equation modelling
SRHMC	Southern Regional Hydro-Meteorological Centre of Vietnam
SRMR	Standardised root mean residual
TLI	Tucker Lewis index
$\chi^2$	Chi-square
UN	United Nations
UNFCC	United Nations Framework Convention on Climate Change
VIF	Variance inflation factor
WWF	World Wildlife Fund

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