



# Factors influencing people's knowledge, attitude, and practice in land use dynamics: A case study in Ca Mau province in the Mekong delta, Vietnam



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## ABSTRACT

Land use is rapidly changing within the Mekong delta due to decisions of local actors. This study aims at understanding the factors influencing the understanding of inhabitants about the concepts, causes and effects of land use and cover changes (LUCC), as well as how they perceive and act about LUCC management. A Knowledge-Attitude-Practice (KAP) survey was carried out on a sample of 330 households in the Tran Van Thoi District, Ca Mau Province in the Mekong Delta, Vietnam. The respondents were surveyed on their knowledge of the conceptualization of LUCC, how LUCC are caused and what their consequences are. The results highlight the political, socio-demographic, economic and environmental causes and effects considered as meaningful by the respondents for understanding LUCC process. Multiple logistic regression (MLR) models with nested cross-validation were developed for investigating the factors influencing the knowledge, attitude and practice of individual households. Although variation exists in the significant predictors of the different K-A-P components, educational level, age, participation in group activity, access to communication mean, and occupation (farming or permanent employment) are shown to be the main influencing variables. The knowledge of the concept of LUCC, and to a lower extent of its causes and consequences, highly correlates with the Attitude and Practice regarding LUCC management, indicating the necessity of disseminating and enhancing LUCC understanding among local actors before implementing land use management projects.

## 1. Introduction

Land use and cover changes (LUCC) are the result of the interactions between humans and environment (Valbuena et al., 2010). The phenomenon has become the focus of ample research due to the magnitude of human alterations of the Earth's surface (e.g. Odada et al., 2009). LUCC are driven by political and institutional, socio-economic, technological, and biophysical – environmental factors (Bilborrow, 1987; Carew-Reid, 2008; Giri et al., 2003). Such changes have significant impacts on food security, local/global climate dynamics and its impacts, biodiversity, biogeochemical cycles, water availability, soil and environmental quality, human welfare, and socio-economic development (Lambin et al., 2003; Lin et al., 2009; Meshesha et al., 2014). Understanding the drivers and outcomes of land use/cover changes require new research approaches linking local actions with their wider socio-political, economic and environmental context (Brondfizio and Chowdhury, 2013; Ostrom, 2009), as social structures, individual decisions, and ecological factors interplay in complex ways to shape land use and cover patterns at multiple scales (Roy Chowdhury et al., 2011;

Veldkamp and Verburg, 2004).

Multiple drivers of LUCC have been identified in previous research. According to Lambin et al. (2003), there are five fundamental high-level causes of LUCC. First, resource scarcity leads to an increase in the pressure of production on resources, driven by population growth, or decrease in land availability due to encroachment by other land uses. Second, changing opportunities are created by markets, e.g. increase in commercialization and agro-industrialization, or changes in market prices of inputs or outputs. Third, external policy interventions, e.g. economic development programs or war, also contribute to LUCC. Fourth, loss of adaptive capacity and increased vulnerability of population might be drivers of LUCC; for example, natural hazards can lead to crop failure, loss of resource, or loss of productive capacity. Fifth, there are changes in social organization, in resource access, and in attitudes, such as lack of public education or growth of urban aspirations (Lambin et al., 2003).

Along with studying the linkages between LUCC and dynamics in coupled human-environment systems at macro level, much attention has been given to investigate how LUCC are determined by the

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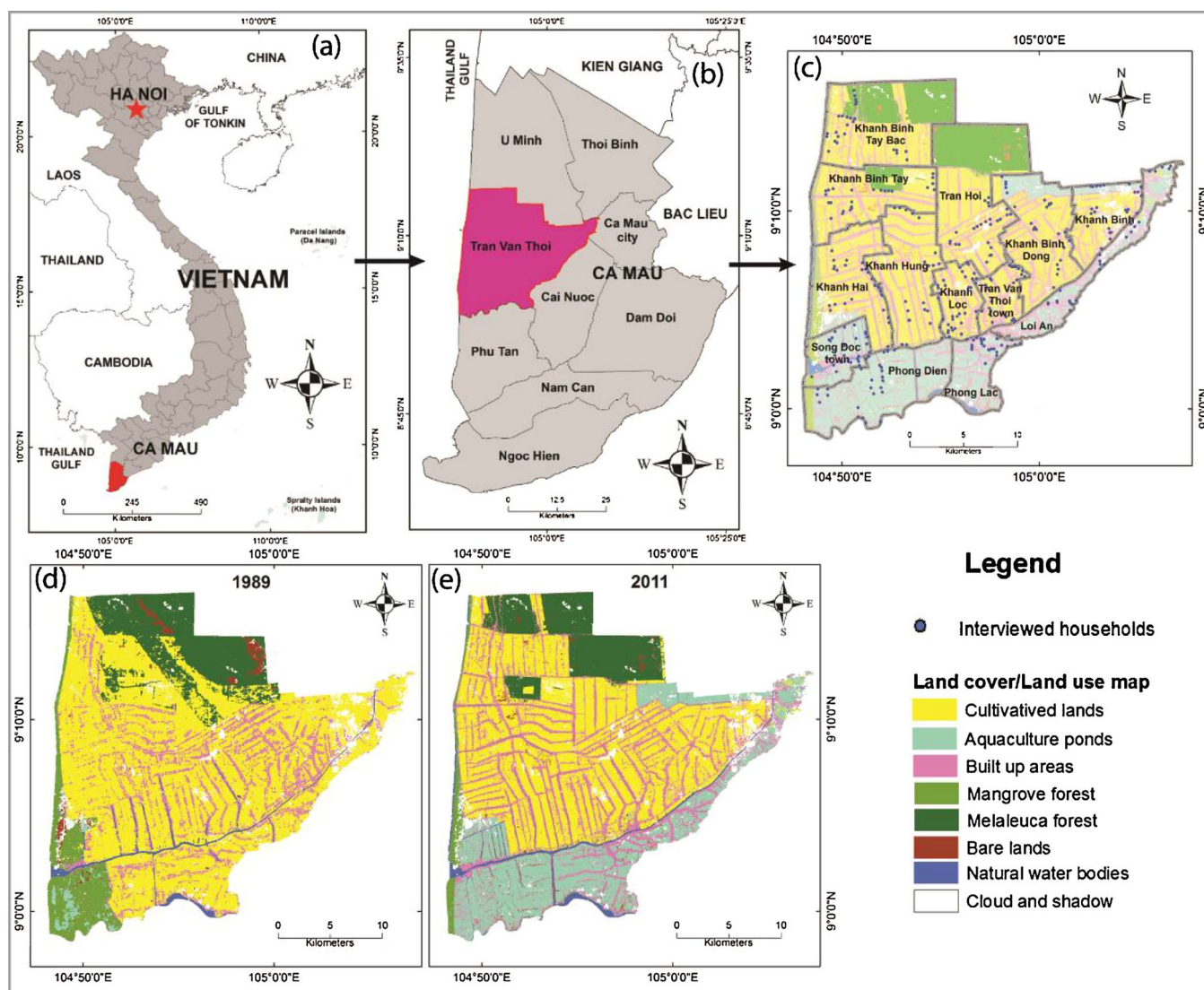


Fig. 1. Location of the study area (a–b), distribution of interviewed households (c), and the land cover/land use change over 22 years (1989–2011) (d–e).

decisions of individuals and households at micro level (Parker et al., 2003). Previous studies applied qualitative and quantitative methods used in social sciences and micro-economics, together with the widespread application of cellular and agent-based models, in order to examine the patterns, causes and effects of individual land-use decision making (Evans and Kelley, 2004; Veldkamp and Verburg, 2004). These studies provided insights into the complex of social-economic and biophysical factors which drive land-use decisions of individuals (Lambin et al., 2003). However, little attention has yet been paid to the role of these factors in shaping the perception of people about land use change and LUCC-related activities, and how their perception affects their LUCC actions in practice.

In the last two decades, land cover and land use in the Mekong Delta in general, and in the Ca Mau Province in particular, have changed dramatically (Binh et al., 2005; Lam-Dao et al., 2011; Sakamoto et al., 2006). Specifically, the Tran Van Thoi District of Ca Mau embraces diverse land cover/land use types: paddy rice, *Melaleuca* and mangrove forests, aquaculture ponds, and settlements concentrated along the river and canal network (Fig. 1, Tran et al., 2015). The area has experienced significant transformations in land use and land cover, including conversion of forests into agriculture and aquaculture land, associated with general expansion of aquaculture and built-up areas. These rapid and large scale LUCC processes make the Tran Van Thoi

District an interesting case study to gain further insights into the influences of socio-economic factors on human perception and behaviors relative to land use change practices. Indeed, due to the widespread implications of LUCC, specific land use policies are planned and implemented to control and steer LUCC in specific directions, i.e. this includes policies to develop aquaculture ponds in the salinized regions (Binh et al., 2005). To understand the compliance of individual to these LUCC policies/programs, it is needed to investigate which factors determine the level of understanding and perception of local people to LUCC and LUCC-related activities.

We apply a *Knowledge, Attitude and Practice (KAP)* survey and a logistic regression model to analyze the perception of local people about land use changes. The main objective of this study is to identify the factors that influence the understanding of the concept of LUCC, their causes and effects; the willingness to take actions; and the current state of participation in any programs relative to land use management in the Tran Van Thoi District. The existing programs related to land use management in the study area are mentioned in Section 2.1. We also explore how the knowledge of people are controlling their attitude towards, and their involvement, in these LUCC activities.

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