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Sustainable Land Use and Rural Development in Southeast Asia: Innovations and Policies for Mountainous Areas

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This edited collection of 12 chapters presents the findings of a long-term (2000–2014) interdisciplinary research project of the University of Hohenheim in collaboration with universities in Thailand and Vietnam. The research sought to identify how agricultural practices can contribute to natural resource conservation and poverty reduction in the mountains of Southeast Asia. The book describes this research in 3 stages: the drivers and consequences of ongoing change, potential responses, and how knowledge can support positive change.

The types of transitions occurring in mountainous Southeast Asia mainly refer to the replacement of large areas of isolated shifting cultivation—including mosaics of fallow and swidden—to more commercialized agricultural production, using irrigation and agrochemicals, and higher-value export crops. In order to investigate these changes, the project conducted in-depth research in 2 sites each in northern Thailand (to the northwest of Chiang Mai) and northern Vietnam (to the west of Hanoi) inhabited by Thai, Karen, and Hmong ethnic groups in Thailand and Black Thai and Hmong in Vietnam. The book lists potential threats to agricultural productivity and poverty as consequences of changes within the use of synthetic pesticides and fertilizer, increased use of irrigation water, and changes in labor-sharing between households (pp 15–22). The innovations that have tried to address these changes include enhancing tree crop production (such as lychee), greater irrigation efficiency, and improving performance of local pig breeds (p 19). Potentially useful knowledge includes extending the use of soil and water conservation, mapping of upland areas, discussing impacts of agrochemicals, and collaborative market development for fruit crops (p 21).

The book argues that intensification and commercialization of land use have improved livelihoods of ethnic minorities, but that problems of land degradation, persistent poverty, and pesticide pollution are currently barriers to long-term sustainability. Moreover, there are still substantial inefficiencies in agrochemical use, animal care, and water use, for example, and the need for governments to target especially vulnerable households (pp 22, 488). These conclusions, of course, are hardly surprising. But where this book contributes significantly to the literature is in presenting detailed empirical research in the following chapters on themes such as soil and water flows, stress from water demand in the uplands, cultivation on sloping land, the relationship of agriculture and poverty, and innovations such as aquaculture, participatory development, and knowledge provision for marginalized people. These chapters resemble a special issue of an agricultural or land use journal, each chapter authored by multiple researchers, and with details of research design, diagrams, and photographs from each site.

Accordingly, this book presents much useful and innovative work for researchers and policy-makers who specialize on physical-science or economic aspects of upland soil, water, and agriculture. For example, the book discusses gamma-ray spectrometry as a way to overcome the simplifications about "slope complex" soil maps, complete with statistical findings from different rocks (pp 35–48). These data are then compared with "ethnic minority soil knowledge systems" (pp 64–75); used together, these are claimed to "help prevent inappropriate decisions being made in terms of land-use planning" (p 77). Similarly, the discussion of water and matter flow (pp 109–148) is framed in terms of how current land use impacts upon land and water qualities and presents detailed measurements and photographs of runoff and water use in the study sites. Agricultural pesticide use (pp 149–173) is analyzed by presenting data about pest problems experienced by farmers, pesticide use, and ecotoxic risks such as the continued use of the banned endosulfan in Thailand and the high concentrations of chemicals in runoff following storms (p 162).

The statistical style of analysis is also applied in the discussion of poverty (pp 175–212), which provides data on how far different households relied on different cash reserves to survive shocks to agricultural production (p 186), the implied discount rates of investing now as per perceived future benefits (p 191), or contingent valuation methods to identify willingness to invest in landslide prevention programs (p 207). This chapter does not, for example, discuss livelihood opportunities such as migration, access to higher-value crops, or trade. Similarly, discussions of new technologies for high-value crops such as mango and longan (pp 215–228) focus on the important theme of improving water efficiency rather than market access or payments for labor.

The book concludes with chapters discussing participatory approaches to research and development (pp 321–366). Participatory methods are described as "inappropriate as 'stand-alone' research techniques," but useful when combined with "conventional research methods" (p 332), or as a means of adding context to modeling of payments for ecosystem services (pp 342–350). The authors note that lack of trust can be

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a significant barrier between forest departments and villagers (p 349). This theme of collaboration is discussed further in the discussion of knowledge, which focuses on the participation of diverse government and nongovernmental groups supplying extension services to diverse farming groups (pp 433–462).

The final chapter discusses policies for sustainable development, focusing especially on the commercialization of smallholder agriculture (pp 463–490). This chapter considers whether intensification has increased productivity and incomes. It concludes (again unsurprisingly) that intensive cultivation on steeper slopes is unsustainable in the long term (p 488) but does not discuss why this cultivation occurs (or by whom). Indeed, the chapter calls for targeted assistance for the region's chronically poor but does not expand on how this might occur (or why it has not yet occurred) (p 488).

This book is undoubtedly an empirically rich analysis of various aspects of land use constraints and changes occurring in mountainous regions of Southeast Asia, and it updates the literature significantly. Yet, the book also adopts a rather literal and descriptive tone of analysis, in which problems of livelihoods and poverty are analyzed as currently experienced through current activities such as cultivating crops on steep slopes or with limited technologies—rather than in terms of longer-term transitions in the diversity of livelihoods, or how social, political, and economic factors might contribute to development outcomes. At various times, the book refers to upland farmers as "marginalized" (p 349) or "disadvantaged" (p 448) without discussing how these situations have occurred, or how these factors influence potential solutions. There is no real discussion, for example, of how government policies (such as monoculture plantations, land classifications, or commercial strategies) are part of the problem or part of the solution.

Instead, the book relies on descriptive physical and economic analysis to describe situations as they currently occur, without reference to how problems of soil and water might become less threatening with adjustments in overall income opportunities (as has been noted in various locations). It would be a mistake to identify all development problems in mountainous Southeast Asia as questions of managing agriculture and slopes better, and consequently, this book might be considered somewhat limited in its contribution to debates about development in general. But it certainly provides unusual levels of detail about technical aspects of agriculture, soil, and water in these regions.

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