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## Chapter II

### LITERATURE REVIEW

#### 2.1 Land Use Changes and Role of Socio-economic Factors in Land Use Changes

Land use pattern may be characterized in two ways: by the variety of uses that occupy some part of the available area and the share each use has in the area, and by the total degree of intensity with which the area is used (Dovring, 1987). Land use has been widely studied in theory and real situation at different levels by the scientists in different fields such as geography, economics, anthropology, etc. Many studies show that socio-economic factors can influence land use greatly. These factors exist at different levels of social hierarchy, and some of them are internal and relevant to the household while some are external and relevant or not relevant to the household. As Rerkasem (1995) mentioned, to understand changes in mountain land use today requires not only a focus on the village itself, its households and their members, but also recognition of interactions with neighboring villages, nearby urban centres, and the rest of the country, and it is becoming increasingly necessary to consider relationships beyond national borders. Dovring (1987) suggested constraints or determinants of social and economic factors on land use include population, income, the sector composition of the economy at both national and regional or local levels; marketing, infrastructure networks, institutional change.

A land use pattern is the result of the decision making of land managers. Blaikie and Brookfield (1987) believed that there are non-place-based or non-location-specific networks of economic, social and political relations acting directly and indirectly upon land managers. These relations therefore usually do not have a geographical expression at all but nonetheless have important repercussions upon the decisions of the land manager.

Land tenure and reform, taxation, prices of inputs and outputs of the agricultural system, soil conservation programmes or logging concessions - all these can be relevant factors in the process of agrarian change for land managers. Outcomes of land use and management practice are the function of social and environmental data which include access to natural resources, access to labor and capital, knowledge and skill, institutional structures, objective function of production, etc.. The political economy determines and provides the dynamic for changes in the agrarian structure, which is immediately reflected in changes in the circumstances of the land manager.

Many studies concluded that population pressure is the main cause of land use changes, especially for tropical land. In the study on the population growth, for example, Boserup (1965) maintained that the growth of population is the major determinant of technological change in agriculture. As population pressure increases, progressively more intensive systems of land use are adopted, combined with consequential change in method of cultivation and the choice of tools. In Iskandar's (1991) research on shifting cultivation in west Java, he found the increase of population pressure led to the change from "forest fallow" with a fallow period of 20-25 years to "bush fallow" with fallow period of 6-10 years, and to "short fallow" with fallow period of one to two years only. However, Blaikie and Brookfield (1987) argued that population growth is not the only independent variable that influences agro-technology, it is one factor in association with other causes.

In market-oriented agriculture, farmers' decision on production is greatly influenced by market demand, and effective marketing depends on transportation. These external factors will be interpreted in different ways by different individuals, and their effect will indeed vary according to land and climatic resources within any one country to which they

apply. On the other hand, land tenure influences farmers' plan and investment on land use (Symons, 1965).

Village studies in other areas in the region has shown that changes of land use are the results of various changes in socio-economic condition. Cooper's (1984) historical study on Hmong response of resource scarcity caused by population pressure showed that, immigration southward to Northern Thailand from Southern China was the Hmong's response to the resource scarcity from the end of nineteenth century to the beginning of twenty century. The adoption of maize and opium were also Hmong responses in Northern Thailand. Rerkasem (1994) revealed that major changes in the land use pattern in the mountains of Thailand are: the virtual ending of voluntary village relocation, intensification of land use, more technology adoption and commercialization. The causes of changes are: increased population; farmers' felt the need to increase productivity and to improve the stability of their production; government policies including nationalization and integration policy, enforcement of forest and watershed conservation and afforestation schemes, strict law enforcement on illicit opium cultivation, improved access and transportation, and therefore market opportunities to increase productivity. These changes also led to the change on livelihood system such as disappearance of cultural and ethnic differences, and mobility and off-farm employment.

Land use changes caused by the changes of socio-economic factors produced some expected dynamic consequences. Rerkasem (1995) pointed out that in Northern Thailand, intensification and commercialization of highland agriculture simply helped increasing yield per area has effectively reduced pressure on the land. On the other hand, in many cases intensification and commercialization have led to a loss of genetic resources of many domesticated species, and loss of indigenous knowledge of their use and management, and

commercialization of farmer subsistence activities may lead to resource exploitation beyond the level of maximum sustainable productivity. Some socio-economic changes had the indirect impact on land use through the medium. For example, improved transportation and communication have meant better access to public services and markets in local and national urban centers.

Thomas (1988) pointed out that, from the villagers' point of view, their land use pattern reflects the manner in which the land resources of the area can make their optimal contribution in returns to villagers' time and effort under prevailing condition. Government agricultural and rural development programs and price levels can influence village land use allocations by modifying prevailing conditions. In his study of village land use in Northeast Thailand, Thomas proposed and tested a model of village labor allocation to explain and predict the impacts of changes in labor utilization opportunities on village land use pattern. He found that the proportion of village labor allocated to any one activity is inversely related to the expected returns to labor from any other activity; that the geographic extent of village land use is inversely related to the opportunity costs of village labor in its most land-consuming uses; and that government quota restrictions limited access to crop markets, and then influenced land allocated to these crops.

Policy changes and their effects on land use happen in any area of investigation. In China particularly, the implementation of land reform policy has affected the use of farm and state forest land. At the beginning of 1980s, the land reform policy was implemented to reallocate farmland and some forest area to individual households according to number of family members or labor size. The decision maker of land use changed from government to farmer, but the government still had some mandatory planning on certain crops for farmers to grow from year to year (Fu, 1993). The land reform policy became

the incentive for agricultural production as farmers can make their own decision about what to produce, according to market demand. Consequently, this reform led to great increase in agricultural output, rapid growth of economy and development of marketing systems in China, and these further supported the development of market-oriented agricultural production (Xu and Peel, 1991).

Some studies in China also show that some socio-economic factors were determinants of land use changes. Menzies (1995) proposed that shifting cultivation was not the only component in farming system in southwest China any longer, it is only one component of mixed farming system which also includes permanent cultivation as well as significant areas of grazing land. Farmers respond to the endogenous and exogenous changes and pressure of the whole system by changes in management practices in different components. The most easily identified source of endogenous change is demographic pressure, and intensification of agricultural production through technical change is the most likely response in this case. But the communities are least well-equipped to deal with rapid and unexpected exogenous pressures including land use legislation, policies and economic development. He argued that the shifting cultivation was not the most influential factor on environmental degradation as the government thinks, but degradation is the outcome of policies conceived and implemented by the political centre which is assigned to culturally distinct and politically marginal upland communities. Ying (1994) studied shifting agriculture in Yunnan Province, and found that external factors including policies and economic changes had greatly influenced land use of slash-burn hill cultivators in Yunnan who began to open up new paddy land as well as to change to the permanent cultivation on upland and develop economic forest plantation. Guo, et al. (1991) pointed out that the problems of agricultural land use in Yunnan are related to reduction of the arable land,

decreasing of soil fertility, deforestation, low productivity, serious soil erosion, increasing polluted area, lack of input, and insufficiency of management. Apart from the constraints of physical factors, some socio-economic factors such as population and education, economic development, technology, policy etc. play great roles in these problems. In the study on agroforestry system in Yunnan, Guo and Padoch (1995) revealed that multiple variables, including population growth, market fluctuations, and land and agricultural policy changes, affect changes in agroforestry systems in Yunnan. As agroforestry systems are developed and transformed, the total landscape and variety of land uses changes as well. Thus the roles of forests, dry land agricultural fields, paddy fields, homegardens, bodies of water, forestry plantations, and agroforests vary in relation to each other. These changes include cutting of forests for monocultural production of annual food crops on the slopes, and unsustainable planting of pure stands of commercial crops such as rubber, tea, sugar cane and fruit trees. The transformation of swiddens and swidden fallows into intensive agroforestry systems, often combined with permanent agriculture such as paddy cultivation, has occurred both in indigenous villages in Yunnan and on some national farms, and are combined with diversification of homegardens.

Apart from farmland, land use in forest areas also was greatly influenced by forestry policy. Fan (1995) studied the implementation of the forestry policy -- "Lin Ye San Ding" (stabilizing forestry ownership, delimiting private wood land, determining contracted family responsibility system on forestry) -- in Yunnan during 1981 to 1990. He concluded that the policy had both positive and negative influences on forest. It assured the farmers' stable land tenure in forests. This policy increased the productivity of the forest and gave more benefit to farmers while the forest was well protected and restored. But, due to a variety of faults in implementing work, the system has also caused constant

occurrence of the tendency that peasants consider only immediate interests, destroy the forests, nibble and seize state-owned forest. Zhao et al. (1993) found in his social forestry study that the implementation of this policy led to the degradation of forest and shifting of forest land to the plantation of crops or cash trees in Jinghong county which is one of the three counties in Xishuangbanna.

## **2.2 Land Use Responses and Different Socio-environmental Settings**

Normally, human resource use activities are determined by resource endowment, cultural endowment, institutions and technology. Due to the different living environment and social development process, these four components are different from group to group, i.e. there are great differences in terms of natural resources, productivity, education level, living and production pattern, indigenous knowledge, conception of value, belief, etc. (Blase et al., 1971).

There are 14 indigenous ethnic groups in Xishuangbanna, in which Dai account for more than one third of total population, Han takes almost one third and other ethnic groups like Hani, Bulang, Lahu, etc. takes the remaining one third. They were at different socio-economic development stages in 1950 (Zheng, et al., 1986). From the studies of Cao (1988) and Ying (1994), it can be seen that the land use among Dai, Hani and Jinuo in Yunnan were quite different before 1950 when Chinese Communist Party liberated Xishuangbanna. At that time, Dai was the ruling ethnic group of the whole Xishuangbanna. The highest ruler of Dai owned all the land in Xishuangbanna, and all the people in Xishuangbanna including Dai and other hilltribes had to pay tax to him for cultivation. There was a unique land tenure relationship between the Dai and other ethnic

groups. Land tenure systems of Hani and Jinuo were similar. Within Dai, there were different and very detailed land tenure patterns for different social strata mainly concerning paddy land. Traditional land tenure of the Hani and the Jinuo concerned use of shifting agriculture land and forest. Collective ownership was the main tenure form for the Hani while the Jinuo had collective ownership, clan management system and individual ownership. Paddy rice was the dominant crop for the Dai, and the Dai area was one of the original places of the paddy rice in the world. Hani and Jinuo used to practice shifting cultivation on the hill. With implementation of production development policy in Xishuangbanna in 1950s, most of hill ethnic groups such as Hani and Jinuo were encouraged to acquire paddy land (Xu et al. 1987).

Sam (1995) reported that, after the government carried out fixed cultivation and sedentarization programme in Vietnam, different ethnic groups which engage in shifting cultivation adopted new technology (e.g. paddy rice plantation) differently.