
Chapter III

RESEARCH METHODS

3.1 Site Selection

Three villages were purposively chosen -- Manzhang of Dai, Baka of Jinuo and Medeng of Hani in eastern part of Xishuangbanna. The Dai, Hani and Jinuo are the three main ethnic groups in this area. Manzhang and Medeng are governed by Menglun Township while Baka is administrated by Jinuoshan Township. Being on the border of Menglun Natural Reserve (MNR), as for these three villages, land uses are greatly influenced by MNR management activities as well as other government initiatives. All the three villages are near Menglun Township and Xishuangbanna Tropic Botanical Garden (XTBG). The economic and marketing development in Menglun Township as well as rapid development of tourism activities in XTBG in particular and in Xishuangbanna in general in the last 15 years can represent the development trend in whole Xishuangbanna. So, these three villages should be representatives of the communities undergoing land use change in the last fifteen years in a similar environment of rapid increase in degree of commercialization and the implementations of government policies for the area around MNR. Meanwhile, before 1950, these three villages and their respective ethnic population had different living and productive environment, socio-economic development process, cultural endowment among other things, as well as had great difference in traditional land use among them.

3.2 Conceptual Framework of the Study

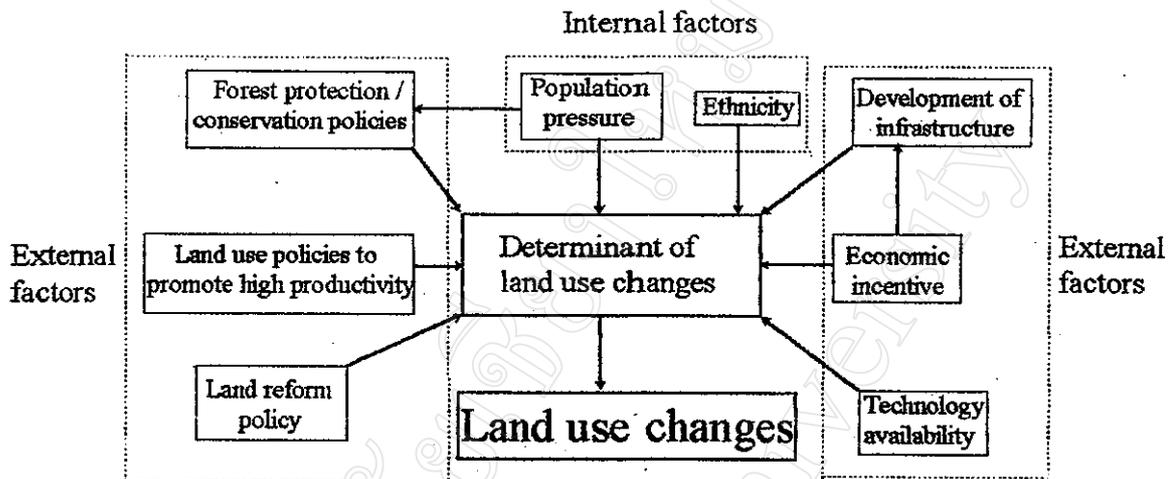


Figure 3.1 Framework of the study

This study contends that land use changes at the village level are the results of local response or technology adoption due to some socio-economic changes. These socio-economic changes include the changes of internal factor (population and ethnicity) and external factors (economic incentive, policies, etc.). Land use changes can lead to the situations ranging from land degradation to resource conservation.

3.3 Data Collection

Primary and secondary data were collected at village, township, county and provincial levels with formal and informal survey methods.

3.3.1 Village Level

At village level, data was collected by Rapid Rural Appraisal (RRA), Participatory Rural Appraisal (PRA), and formal survey. In formal survey, the structured questionnaires were administered randomly with around 50% of the households in each site in order to

minimize the general error of sampling.

Collected data at village level includes land resources allocation, input and output of each allocation, sources of input and distribution of output, farmers' decision on land allocation, implementation of government intervention on land use.

3.3.2 Township Level

At this level, data of study area was collected, including: statistics of land use for fifteen years, information on development of market, implementation of policies, and changes of economy. Interview and discussion with local officials was also conducted.

3.3.3 Prefecture Level

Information of whole prefecture was gathered at this level, which includes: soil map, related reports such as Agricultural Regional Planning, Development Plan of Prefecture, etc.

3.3.4 Provincial Level

Published materials were collected at this level including Provincial Year Book, survey reports related to the research topic and area. Land use maps, topographic map and aerial photos were also gathered and utilized.

3.4 Data Analysis

To fulfill study objective 1, a systematic description of present land use pattern is conducted for each village in chapter V. Firstly, land use maps, transects, crop calendar, present land resources allocation in space and time of each village are presented; and then, a systematic description including detailed information of each land use type such as land ownership, land type, crop varieties, input, output, cropping index, are provided. Study objective 2 is achieved by description of historical review of land use, and the comparison of land use maps, trend of planting area change in each crop and trend of cropping index change.

To achieve study objectives 3 and 4, agroecosystem perspectives will be applied to identify the socio-economic causes of land use changes. The focused level of hierarchy in this study is village; and the data and information from household samples will be used to explain behavior of land use at village level, both socio-economic components of the focused agroecosystem and its environment will be taken into account. Roles of most socio-economic causes of land use changes will be analyzed by descriptive method.

For both identification of driving forces and comparative purposes, the following methods are applied to estimate the role of population pressure and marketing on land use changes in each village. According to Guo et al. (1991), commercialization ratio of farm and commercialization rate of each crop can be used to show the degree of farmers' participation in marketing, and the trend of commercialization ratio of farm explain the changes of farmers' participation in marketing to a certain extent.

$$\text{Commercialization rate of each crop} = \frac{\text{sale quantity}}{\text{total output}}$$

$$\text{Commercialization ratio of crops} = \frac{\text{number of crops for sale}}{\text{total number of crops}}$$

An area response function is applied to show impact of price and population on production for each village, and Chow test is used to test slope of all coefficients of different equations. This model was developed from Johnston (1984).

$$A_i = f(P_i, P_j, POP)$$

Where A_i = planted area of i th crop

P_i = price of i th crop

P_j = price(s) of the competitive crop(s) of i th crop

POP = population of the village

Population curve and curves of farmland per person change are used to illustrate population pressure on land resource.