CHAPTER III

RESEARCH METHODS

In this study, cotton-based farming households were treated as the basic information on the accessibility of different livelihood assets contribute to livelihood outcomes along with their strategies and also examined as their major problems in cotton production. The household samples were randomly selected to determine their characteristics. In the analysis of data, both the primary and secondary data were utilized.

3.1 Conceptual framework of the study

According to the sustainable livelihoods framework presented by the U.K. Department for International Development (DFID) (1999), the conceptual framework (Figure 3.1) was adopted in this study. The overall objective of this study is the determination of the effects of livelihood assets on farmers' strategies and outcomes in post-monsoon cotton production system. According to this main objective, the conceptual framework describes the livelihood strategies adopted by the sampled farmers in the selected areas to achieve outcomes according to their livelihood assets evaluated under five capital assets and vulnerability context. Households' adoption of livelihood strategies was measured in terms of cotton productivity, more total income and soil fertility improvement and pest reduction.

Production Constraints

1. Poor land preparation
2. No optimum sowing time
3. No recommended spacing
4. Poor seed quality
5. No seed treatment
6. Pest problem
7. Lack of inorganic fertilizer
8. Lack of FYM
9. Non appropriate rainfall
10. Labor shortage
11. Limited financial
12. Low product price and quality
13. Insufficient extension contact

Livelihood Assets

Human capital
Age, Size, Experience, Labor

Natural capital
Soil texture, Total land, Cotton land, Water availability

Physical capital
Transportation, Seed, Fertilizer, Pesticide, Machinery and draught power, Farm tools, Cattle

Social capital
Extension contact, Labor network

Financial capital
Income, Saving, Credit

Appropriate Policy Implication

Government policies on:
- Extension services and training
- Contract farming
- Financial support
- Inputs support (seed, fertilizer and pesticide)
- Establish local price
Private sector
- Input supply (seeds, fertilizer and pesticide)
- Extension services

Appropriate Livelihood Strategies

Strategies on post-monsoon cotton yield
1. Good quality seed
2. Plant protection
3. Labors per season
4. Fertility management
5. Recommended growing practices
6. Extension visits per season
7. Crop rotation

Strategies on cotton-based farming system
1. Agriculture
2. Agriculture – off-farm
3. Agriculture – non-farm
4. Agriculture – off-farm – non-farm

Strategies on more sustainable use of NR
1. Diversified cropping
2. Appropriate cropping pattern

Livelihood Outcomes

1. Increased seed cotton yield (kg ha^{-1})
2. Increased total income (kyats year^{-1})
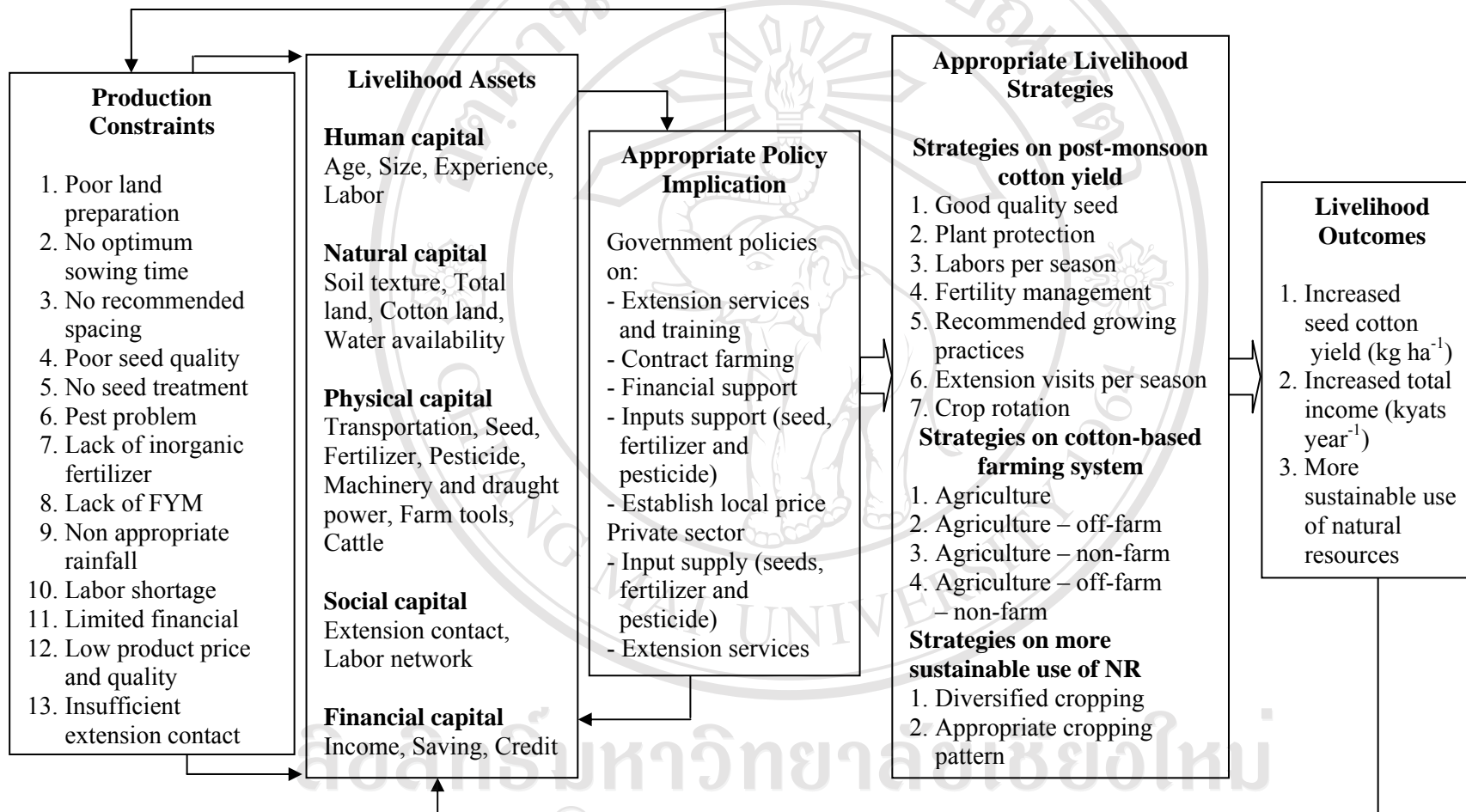3. More sustainable use of natural resources

Figure 3.1 A conceptual framework for household livelihood vulnerability and assets contribute to outcomes along with strategies

Source: Adopted from Department for International Development (DFID) (1999)

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Livelihood assets are the essential components of the conceptual framework. Five capital assets such as human, natural, physical, social and financial assets influence the livelihood strategies and outcomes. Also, problems in crop production influence the households and hence different types of livelihood strategies and outcomes are adopted.

3.2 Selection of the study area

The selection of the study area was based on the major post-monsoon cotton growing area in Mandalay Division which is the largest cotton growing area and has the potential to produce large amounts of high quality cotton. Its annual temperature varies from a minimum of about 21°C to a maximum of around 33°C and annual rainfall is about 882 mm. The total cultivable area under three cotton growing seasons (pre-monsoon, monsoon and post-monsoon) in Mandalay Division was about 142 thousand ha that was 39.48% of total cotton planted area and 33.62% of seed cotton productivity of the country was situated under this Divison.

This study was conducted in Kyaukse, Myittha and Wundwin under Mandalay Division (Figure 3.2). The reason for the purposely selected of those townships was that cotton production was concentrated there with the cultivation of about 23%, 20% and 8% of the total net planted area. The next reason to choose the post-monsoon cotton production was that 76%, 41% and 71% of the cotton planted area was situated under post-monsoon production. In all townships, cotton, rice, pulses, oilseed crops, vegetables and cereals are grown as mono and double cropping and intercropping system under rainfed and irrigated conditions.
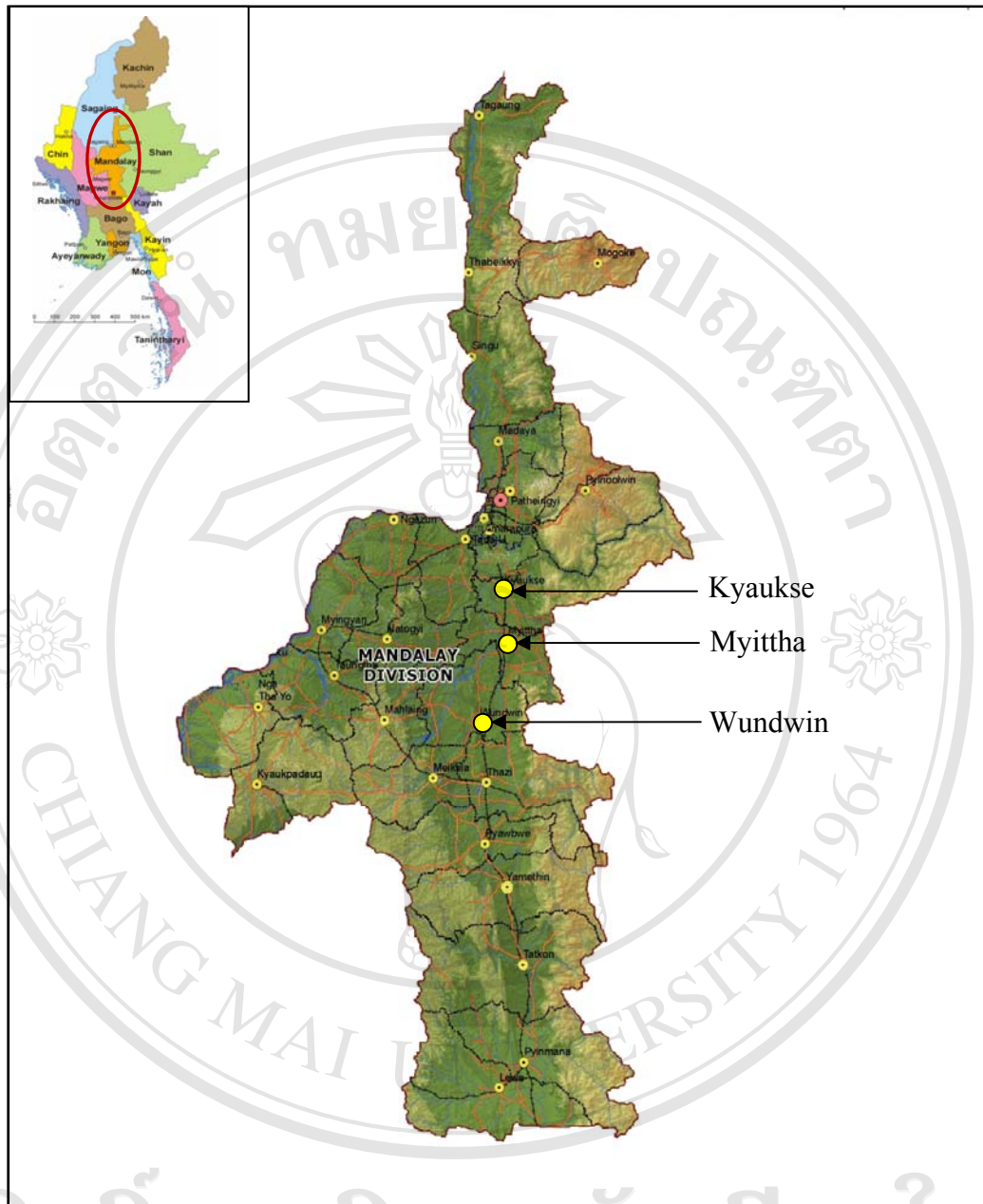
Figure 3.2 Location of the study areas, Kyaukse, Myittha and Wundwin townships,

Mandalay Division

3.3 Sampling technique and data collection

The sampled respondents were selected by using multistage random sampling technique. A total of 150 farmers, 50 household heads in one village of each township were interviewed individually through the structured questionnaire for primary data. Information from each household was collected on the management practices and production constraints of post-monsoon cotton, five capital assets received by farmers, different livelihood strategies and outcomes on post-monsoon cotton production and cotton-based farming system in the selected townships.

The secondary data and the relevant information from cotton-based cropping system were extracted from different government agencies under the Ministry of Agriculture and Irrigation (MOAI) such as Township office of Cotton and Sericulture Department (CSD) in Kyaukse, Myittha and Wundwin, Township office of Settlement and Land Records Department (Kyaukse, Myittha and Wundwin), Department of Agricultural Planning (DAP), Headquarter office of Cotton and Sericulture Department.

3.4 Analytical procedures

3.4.1 Descriptive analysis

The data from the respondents in the study areas by structured interview were analyzed by using descriptive statistics. Different types of descriptive statistical method were used to calculate percentage, frequency and average and to compare the production practices, production constraints of post-monsoon cotton production, different livelihood assets, livelihood strategies and outcomes under post-monsoon

cotton production and cotton-based cropping system across the selected areas. Cost of production, total revenue and net profit were also analyzed.

3.4.2 Correlation matrix analysis

This study used correlation matrix to investigate the multicollinearity of all independent variables. The independent variables used in correlation matrix were identified in Table 3.1. These variables are vital in cotton cultivation to assess the cotton yield.

3.4.3 Multiple regression analysis

The relationship between the cotton yield and the key livelihood asset variables drawn from the results of correlation matrix was determined through the multiple regression analysis. The multiple regression was implicitly specified as follows:

$$Y = \beta_0 + \beta_1 X_1, \beta_2 X_2, \beta_3 X_3, \beta_4 X_4, \ldots, \beta_n X_n + e$$

Where:

Y = Cotton yield (kg ha^{-1})

β_0 = Constant

β_i = Regression coefficients

X_i = Livelihood assets (i = 1,2,3,4,…,n)

e = Error term

Table 3.1 Definition of independent variables: livelihood assets

Variables	Description	Codes/Value
Human capital		
Household size	Number of household members	Number household^{-1}
Education	Education of household head	Years
Experience	Experience in cotton cultivation	Years
Labor	Number of total labor available	Man days ha^{-1} season^{-1}
Natural capital		
Farm size	Total land holding per household	Hectare
Cotton area	Total cotton planted area	Hectare
Physical capital		
Seed	Amount of seed applied	Kg ha^{-1}
Chemical fertilizer	Amount of fertilizer applied	Kg ha^{-1}
Farm yard manure	Amount of farm yard manure applied	Kg ha^{-1}
Pesticide	Cost of pesticide	Kyats ha^{-1}
Land preparation	Cost of land preparation and intercultivation	Kyats ha^{-1}
Farm equipments	Value of farm equipments	Kyats household^{-1}
Social capital		
Labor network	Ability to work together	Dummy 1 = Yes; 0 = No
Extension contact	Number of extension officers' visit	Number season^{-1}
Financial capital		
Income	Income (farm, off-farm and non-farm)	Kyats year^{-1}
Credit	Amount of credit by formal or informal	Kyats year^{-1}