Chapter III

Methodology

3.1 Scope of study

The study concentrated on the analysis of agronomic practices and economic return of coffee farms with age ranging from 11-12 years in one village of DakLak province. The coffee systems, which have been existing in the studies area were studied in terms of the key characteristics of farm structure, technical applied, and productivity. The study was carried out for three coffee-based farming systems: coffee monoculture, coffee - durian intercropping, and coffee - black pepper intercropping, hence called P1, P2 and P3 respectively. Total of 138 coffee farms (46 coffee monoculture farms, 46 coffee-durian intercropping farms, and 46 coffee-black pepper intercropping farms) of the Ea Ktur village, Krong Ana district, DakLak province were surveyed. The market channel and policy supports were not taken into account.

3.2 Data collection

The necessary data regarding analysis was gathered from both primary and secondary sources. The different levels such as structured, semi-structured, interviews and discussions were organized with farmers, key informants and local groups. All secondary sources were included (Figure 3).

3.2.1 Primary data

The data on farmers' coffee management practices were acquired through semi-structured and structured interviews, using a questionnaire. The questionnaire was built up by consulting with the coffee experts and pre-examined first with 4 good experienced farmers from each category of the target groups of farmers and subsequently modified to avoid ambiguities. The final questionnaire was completed after adjusting many questions in accordance with actual circumstances. However, depending on the certain situation in which the technique was used to interview the

target farmers. Group discussion, semi-structured, individual interview (household survey), and key informants' survey were the key techniques applied during working time.

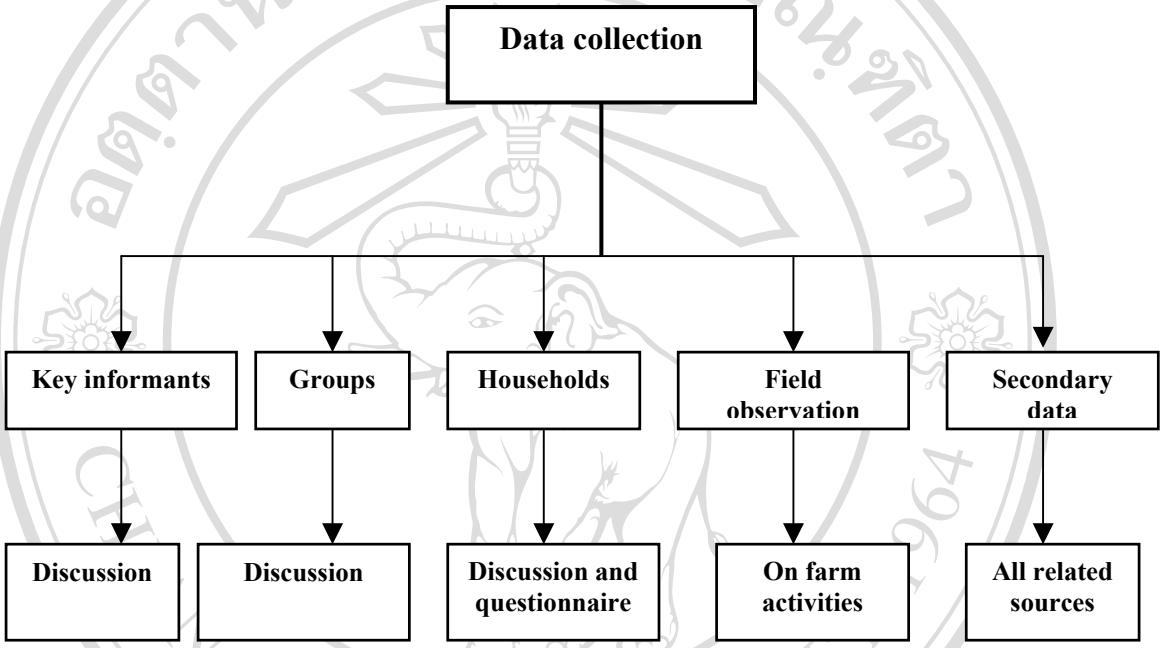

Figure 3. The schematic diagram of data collection methods

Key informants' survey

The 10 village leaders, who have in-depth and clear knowledge and awareness about local socio-economic, biophysical environment and changes were discussed and interviewed. These people provided the holistic views over the changing systems in different aspects such as cropping system, land use and perception, which have been directly, and/or indirectly affecting living styles of the farmers.

Group discussion

Before implementing the interview of individual household by using the questionnaire, 8 group interviews were held in each studied hamlet in order to encourage the target farmers to discuss about constraints and opportunities of existing

coffee production in their village. Factors, concerning the adoption of introduced technologies, were deeply discussed. Each interview involved a group of people, who discussed a common topic above, for one to two hours. The discussions were recorded and used as qualitative data. In addition, with the support from village leaders and the farmers involved in the meeting, the target coffee growers were identified for further survey by using the individual techniques.

Individual technique

Individual techniques were used to collect data from farmers selected above. Individual techniques included face-to-face interviews, questionnaires, and field observations.

The study was conducted from March to November 2002 in Ea Ktur village, Krong Ana district, DakLak province. A total of 138 farmers were selected randomly from 300 coffee growers listed during group discussions. They were interviewed by using a pre-tested and revised questionnaire. Most survey questions were open-ended ones in order to gather all farmers' opinions. Farmers' socio-economic background, farming structure, and farmers' technologies (practices) coffee production were strongly focused on. Farmers were questioned about their problems and experiences in production also.

Interviews were conducted in the Vietnamese language either at the farmers' home or in coffee fields situated within 2 to 3 km away from the farmers' homestead. The farmers were willing to be interviewed in the field. This enabled cross-checking of farmers' answers with field observation.

3.2.2 **Secondary data**

Secondary data from the sources such as census reports, previous studies, and administrative records and reports were collected.

Census reports provided aggregate national and community statistics on population, housing, agriculture, education, health, and labor.

Previous reports included studies run by both groups and individuals of the researchers. Administrative records and reports of both government and non-government organization's documents related to the study were gathered. The relevant records and reports were one of the sources of data.

Besides the data resources, the constraints in coffee production, and possible solutions were considered and recorded during visiting time the local. The perception and responses of other stakeholders were also recorded for analyzing and evaluating the systems.

3.3 Data analysis

The survey data were entered into a spreadsheet and checked prior to analysis. Cross-tabulation with selected variables, percentages and data were undertaken using pivot table in Microsoft Excel 2000. Percentages were based on either the total number of respondents or total responses, details of which were provided in the respective text or tables.

The data was also analyzed by statistical methods. Mean was used to calculate the average value of the data population. Standard deviation of the sample was used to identify the spread out/concentrate or dispersed/homogeneous of the collected data. All of methods above were supported by the data analysis programs in excel.

T-test was used to test for difference between the means of two independent populations of the data set.

The yield/income fluctuation or stability is most conveniently measured in terms of coefficient of variation, denoted by CV%. The mention should be paid that the larger the value of CV%, the higher the degree of instability of the system.

The depreciation cost was estimated by applying the straight-line depreciation method, the easiest method to apply, with the formula as follows

$$D = (PV - SV) / L$$

Where D is annual straight-line depreciation, PV is the item's present value, SV is its expected salvage or residual value of the end of its useful life, and L is its expected total years of life.

3.4 Field measurement

In order to evaluate some factors of ecological aspects among the three coffee systems, the amount of water required for irrigation during dry season, air temperature, wind speed, and soil moisture on-farm have been measured by using following methods and devices.

Amount of water requirement for irrigation was collected through interviews the farmers or technician, who often operated the water pumps. And then it was directly measured by calculating the capacity of the water pump, which could produce water per hour at the site. Then this figure was multiplied by total time needed to calculate the total amount of irrigation water per time or year.

Air temperature in 1.2 m above soil surface (breast height) was measured by using digital hygro-thermometer and licor devices (LI-1,200).

Wind speed movement through the farm was determined by using anemometer vane probe device.

The two devices were placed at the intersection point of among four coffee trees in monocoffee farm, among four durian trees in coffee-durian intercropping farm, and among four black pepper trees in coffee-black pepper intercropping farm. In the whole farm it was set in the center position. These measurements were carried out by a staff of the local meteorological station.

Soil moisture: i.e. estimate percentage of soil moisture content was measured using the gravimetric method. Soil samples were taken in every three farms per each system. 25 days after watering, soil samples at 0-40 cm were collected from five positions. From these samples, a mixed sample at each location was prepared and dried in an oven at 105^{o}C until constant weight. The percentage of soil moisture content W is then given by

$$\%W = \frac{M_w - M_d}{M_d} \times 100$$

where M_w is the weight of the wet sample and M_d is the weight of the dry sample.