CHAPTER 3

Research Method

3.1 Study areas and Methodology

PRA method was used to find out the key indicators of household food security. These keys indicators came from focus group's discussion and individual household survey. The food security context (food availability, access to sufficient food, stability of food stocks and utilization of food) were used as guideline framework for group's discussion. The output from PRA method was used to assess food insecurity of the three differences rubber farm types (Figure 3.1).

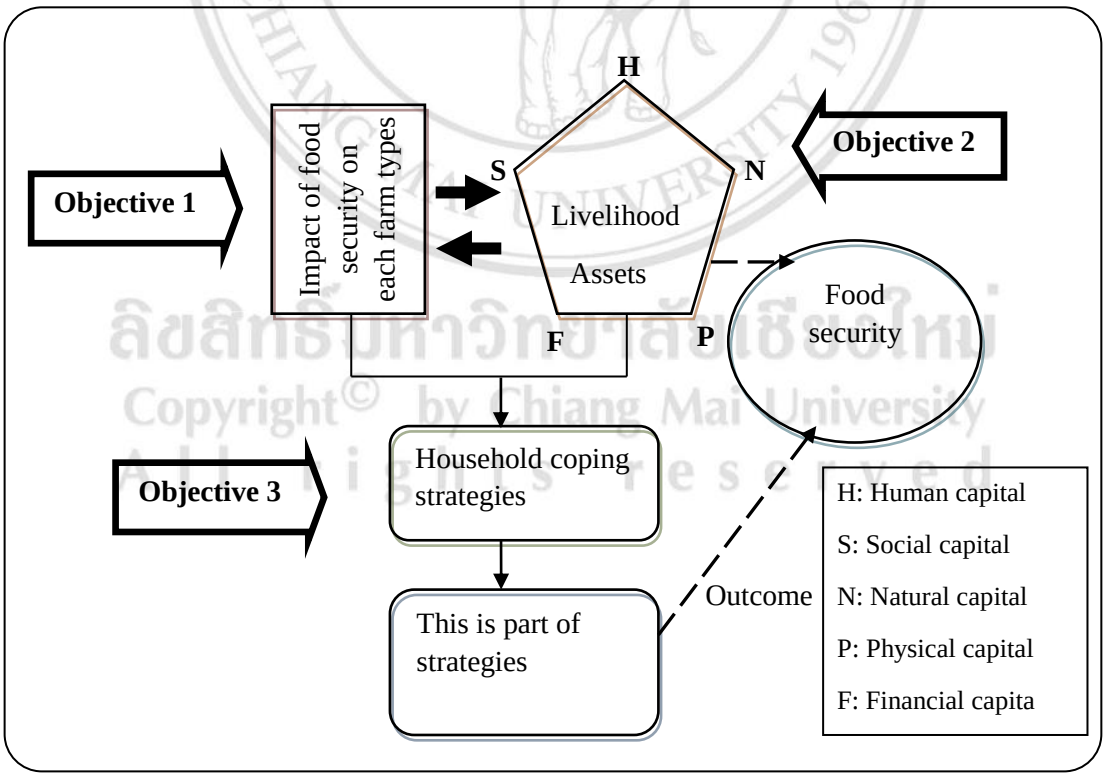

Figure 3.1 The research conceptual framework of this study

Adapted: DFID (1999)

This would also bring better understanding on characteristics of household and food insecurity regarding risk exposure, sensitivity and adaptive capacity, from the past up until present. This study employed the participatory rural approach (PRA) tool to investigate and assess the impacts on household livelihood to food insecurity in differences three farm types at household level. The process of PRA-method was shown in figure 3.2. The process of PRA was follow in two procedures:

First procedure: formulating the key-person meeting at Provincial Agricultural and Forestry Office level (PAFO). This meeting was followed as steps bellow:

Step 1 the arrangement meeting at PAFO was invited key-persons such as: PAFO-staff from agricultural section and extension section, DAFO-staff from agricultural section in Xay district and Namor district in the Oudomxay province. The detail of this meeting was shown in Table 3.1.

Table 3.1 Focus group discussion (FGD)

Participants	**FGD1**	**FGD2**
PAFO	3	2
DAFO	2	4
Head of village	0	4
Farmer's leader	0	8
Total	**5**	**18**

Source: From focus group discussion (2014)

Step 2 the collecting existing information from PAFO and DAFO were used as well as secondary data. This information was used on the meeting of focus group discussion (FGD1) which used for formulation guideline basic information, historical agricultural practice, location of farm production, cropping systems, and number of farmers in the areas of this study. This meeting was interviewed these key-persons for gathering current situation of farming systems as well as farm type in two districts of the study (Table 3.2).

Table 3.2 Output 1 from FGD1

Farm type	Farm location	
	Xay district	Namor district
(A) Upland rice subsistence farm (UR)	V1, V2	V3, V4
(B) Upland rice with rubber plantation (URRP)	V1, V2	V3, V4
(C) Rubber plantation (RP)	V1, V2	V3, V4

Note: V1 = Kornoy village, V2 = Phonhome village, V3 = Nahome village, V4 = Nampheang village

Source: From focus group discussion (2014)

Step 3 Using of results from step 2 in FGD1 to establish the research conceptual framework of this study, arrangement of the meeting for focus group discussion (FGD2) and planning the time meeting at village level. This meeting was followed the information from FGD1 for guidance and structure to find out the situation of farming systems, household livelihood assets (as five capitals) and food insecurity status at village level and their communes. Finally, this process was selected 3 studies sites of farm production and number of farmers in three farm types (Table 3.3). This step was designed guideline of the food insecurity key-indicators for meeting as FGD2.

Table 3.3 Output 2 from FGD1

Farm type	Cropping system	
	Xay district	Namor district
A) Upland rice subsistence farm (UR)	Upland rice, maize, job's tear, vegetables and NTFPs	Upland rice, maize, job's tear, vegetables and NTFPs
(B) Upland rice with rubber plantation (URRP)	Upland rice, rubber, vegetables and NTFPs	Upland rice, rubber and NTFPs
(C) Rubber plantation (RP)	Rubber and NTFPs	Rubber and NTFPs

Source: From focus group discussion (2014)

Secondary procedure: This process was implemented at the village level for meeting as focus group discussion (FGD2). This meeting was followed as steps bellow:

Step 1 The arrangement meeting at village was invited the head of village, PAFO staff, DAFO staff and leader of farmers in the villages. This step was planed the time schedules for conducting meeting, field survey, and household interview that also designed the questionnaire for farmer's household interview.

Step 2 This meeting at village was interview the head of village about situation of farm production, livestock production, non-timber forest products (NTFPs), social institution at village level and food insecurity status at household level and their communes. After that, this meeting was formulated the focus group discussion (FGD2) which involved from leader of farmers, head of village, PAFO-staff, DAFO-staff and farmers in the villages. This secondary process was used the information from FGD1 for form the structure and guidance on cropping systems, farm location, cropping calendar, NTFPs-utilized and protection situation in the village level, livestock production, household livelihood asset, and food insecurity status. The interviewing was followed the historical of crop production, food insecurity occurring from the past to present. Therefore, this meeting was telling the coping mechanism on the household food insecurity in the past to present at household level.

Table 3.4 Output 3 from FGD2

Farm type	Xay district		Namor district		Total (Farmers)
	V1	V2	V3	V4	
(A) Upland rice subsistence farm (UR)	6	33	1	20	60
(B) Upland rice with rubber plantation (URRP)	21	14	15	10	60
(C) Rubber plantation (RP)	50	2	6	2	60
Total	**77**	**49**	**22**	**32**	**180**

Note: V1 = Kornoy village, V2 = Phonhome village, V3 = Nahome village, V4 = Nampheang village

Source: From focus group discussion (2014)

Step 3 The collecting information from FGD2 was used for formulating the questionnaires for household interview. This step was planned for facilitating and household interviewing on their households and field surveys.

Step 4 The arrangement of time schedules for household interview was organized during the step 2 (FGD2) which contributed information of FGD2 by the head of village through the farmer households. The household interview was used 15 to 30 minutes per one farmer's household.

Step 5 The collecting all questionnaires and information from FGD2 were rechecking the missing information from FGD2 and questionnaires.

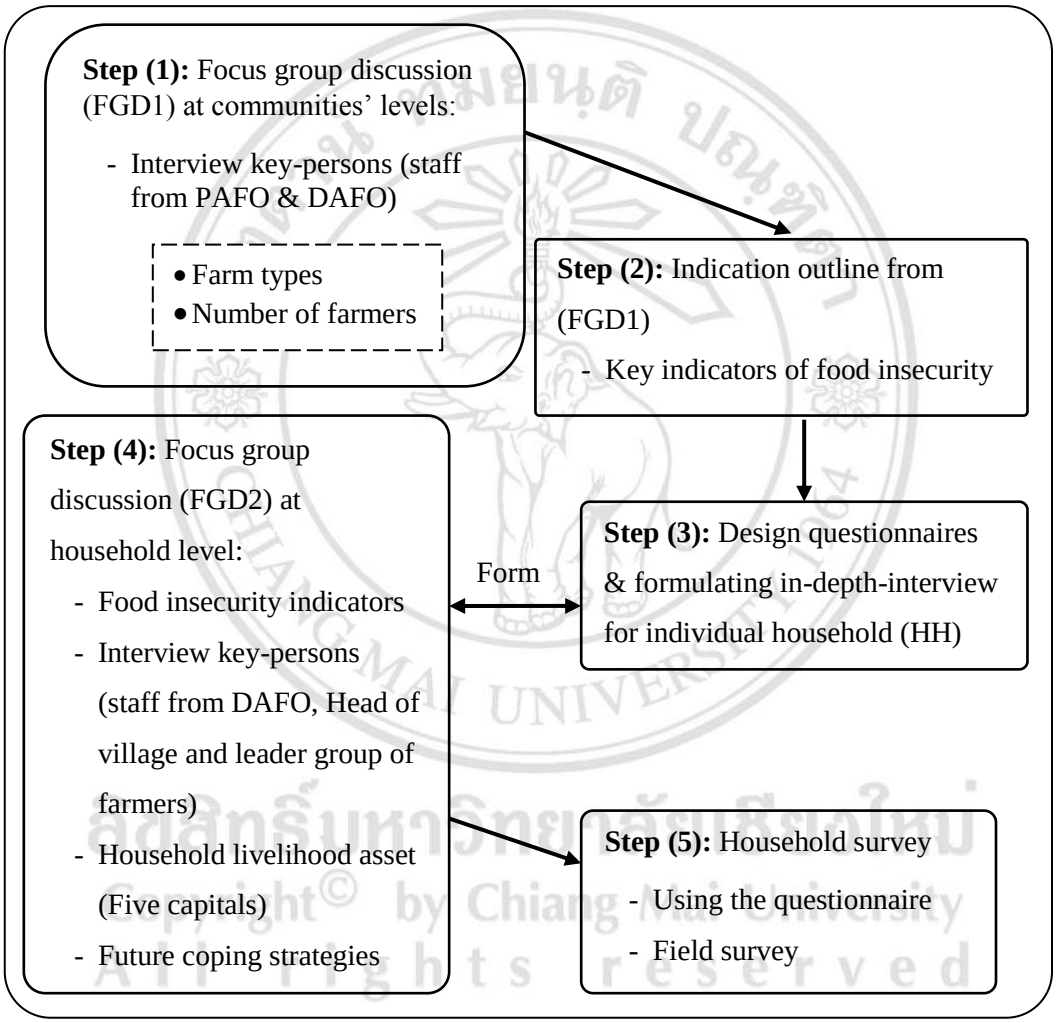

Figure 3.2 The action of implement PRA framework in the study

Step 6 This data was used as primary data and combined with secondary data to used for identified the impact of food insecurity situation on these three farm types and household livelihood assets (Five capitals). Therefore, these data were analyzed for observed of coping strategies from each farm type and also their future coping mechanism.

The purposed of this meeting found out where farmers' cultivation practices systems in the Oudomxay province. To understand and explore the household farming system which farm typology was used for guideline in the key person discussion (Figure 3.2).

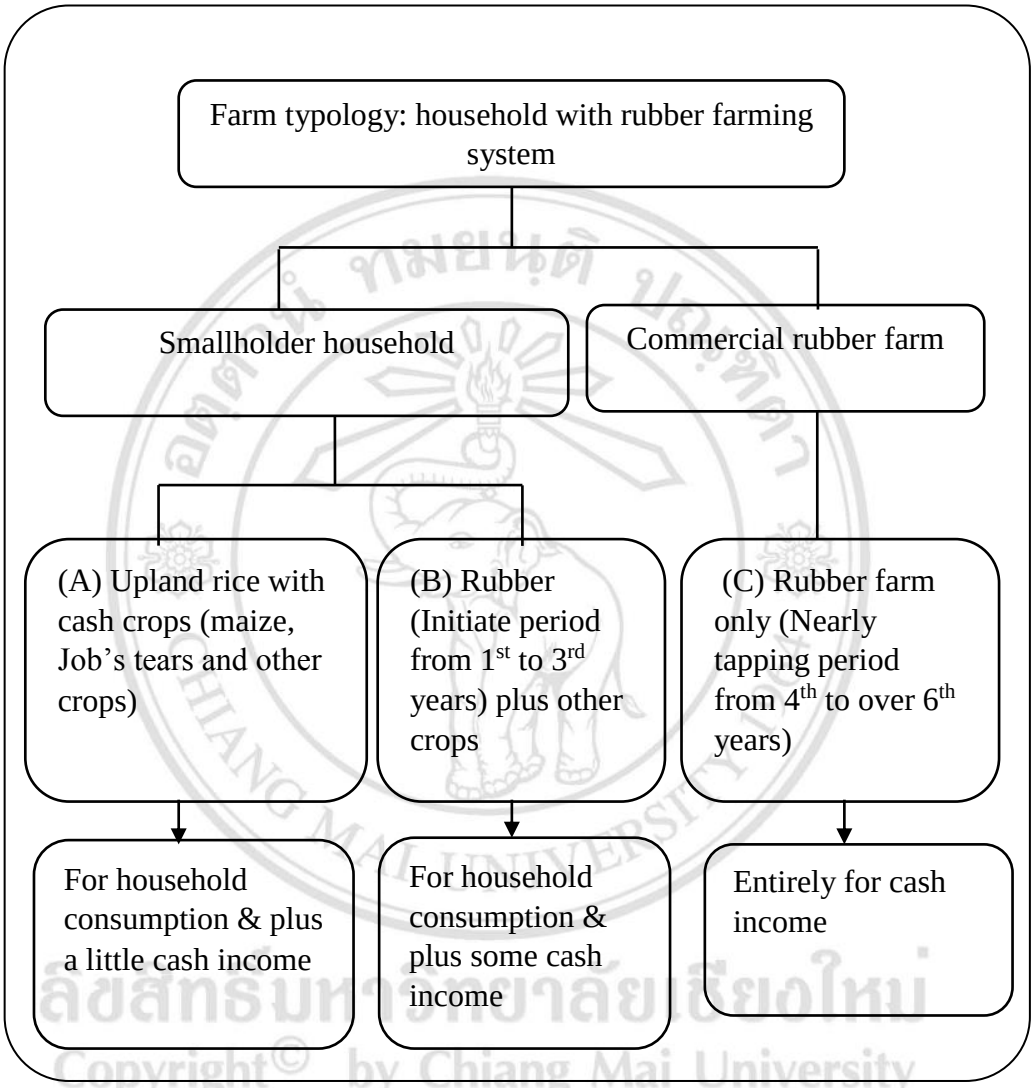

Figure 3.3 Farm typology of household rubber farming systems

Then, the process of focus group discussion (FGD1) to find out the key indicators of food insecurity (KIFiS), and the number of farmers for each farm types. In process of focus group discussion (FGD2) was implemented in the villages at village level. Even through, the FGD2 was also regarded to FAO food security definitions which used in FGD2. Due to precede of FGD1 and FGD2 that information could be applied for formulating the questionnaires for household interview in last step of PAR method.

After that, sampling size of farmers were used a purposeful or criterion-based sampling method for selected the sampling size in each farm types (Figure 3.2). These proceeds were followed as objective 1, 2 and 3. Therefore, it could assess the household to food insecurity, household livelihood assets and future coping strategies in each farm type.

The proposed farm typology of rubber farming system is illustrated in figure 3.3 (Modified: Vongkhamor *et al*., 2007).

3.2 Sampling size

The target farm households of this study were randomly sampled from the three farm types (see in table 3.1) in Namor district and Xay district of the Oudomxay province. The sample size and method were followed a *purposeful* or *criterion-based sampling* method. The total sample size of farmers' households in Namor district and Xay district were 60 households in each farm type with total 180 households. The estimated sample size by purposeful-method was shown in table 3.1. Farm types and periods of rubber plantation were an important element to assess the impact of the transformation upland rice field to rubber plantation.

Sampling method: it had two steps to collect data from households.

- The first stage was the selection of land holding in relation to cultivation areas size of land. In each farm type of land holding size was selected by using simple random sampling without replacement. All farm types in the sampled of the study areas were randomly selected for interview.
- The secondary step was used semi-structure questionnaire for interviews. The household interviews were generally consisted of cultivation areas, crop production, crop yields, and etc. Additionally, this survey was focused an important crops such as rice, rubber, corn, job's tear, vegetables and NTFPs.

Table 3.5 Number of sample size in three farm types

Farm types	Number of sample size (households)
(A) Upland rice with cash crops (maize, Job's tears and vegetables).	60
(B) Upland rice with rubber plantation (Initiate period from first year to third years)	60
(C) Rubber farm only (Nearly tapping period from fourth year to over sixth years)	60
Total	**180**

3.3 Data collection and data analysis

The primary data was collected by interviewing individual sampled household using questionnaire, regarding socio-economic, household demographic, agricultural practices and NTFPs data. These data collection could answer on farmer's household food security, livelihood asset coping food that were following FAO definition (2006). The secondary data was gathered from representative sources from Oudomxay Provincial Agriculture and Forestry Office (PAFO), Namor district and Xay district Agriculture and Forestry Office (DAFO). The process of data collection was followed as below:

1. The primary data was related to land holding in hectare (ha), upland rice yield in ton per hectare (t/ha, total income per household (Lao-Kip), household expenditure on food (Lao-Kip), Sold NTFPs (Lao-Kip), rice consumption (household per year) and crop biodiversity in farm. The following of these data gathered with PRA method were used to collect and analysis which it depend on each farm types.

2. The food crop production and food supply data in each farm type was collected through household survey of income and expenditure that data was collected from total income from farm and off-farm income. This process was collected for food access data and supply. Dissemination of these data from survey was followed FAO definition.

3. The variables data were displaying comparison means of each farm type on food available (upland rice production, crop husbandry (corn and job's tear), vegetables, and non-timber forest products (NTFPs), food access (upland rice production, vegetables, and non-timber forest products (NTFPs), livestock and fish) and utilization (rice product, food, and income from non-food products). Thus, this data had been allowed the matching of food availability with food consumption in household needs. It helped to understand the transformation process from shifting cultivation to rubber plantation farming while it had been shown the profits from farm to support the food security in the household to meet their household's final food consumption needs. In addition, this household survey was collect in food supply for a 12-months period, it allowed to knowing how the shifting cultivation changed to rubber plantation by analysis of cropping pattern and crop biodiversity of each farm types which extended of the food supply was adequate to the nutritional requirements of household member needs.

4. The PRA method with semi-structure interview and in-depth interview with key informants were conducted, as well as the farmers focus group discussion was used in this study. The overview of this conceptual framework was shown in figure 3.1.

The survey data was used to investigate the three objectives of this study which regard to food security definition from FAO (2006). Farm types and periods of rubber plantation were important elements to assess the impact of the transformation upland rice field to rubber plantation.

Following the proceeds from PAR method that could applied for objective 1 on data collection. In-depth interview and semi-structure questionnaire methods were employed for data collection. This corresponds to indicators derived from PRA methods. Then these keys indicators of food insecurity were formulated the questionnaire and the individual household that it gives the scenarios of household food insecurity in rubber farming practices (Table 3.2).

Table 3.6 To assess impact of cropping system changes on food insecurity

Implementers tools	Types of data
• Group discussion • Household survey	It followed by FAO definition (more detail information shown in chapter 2.4 and 2.5). • Food available (upland rice production, crop husbandry (corn and job's tear), vegetables, and non-timber forest products (NTFPs), • Food access (upland rice production, vegetables, and non-timber forest products (NTFPs), livestock and fish) • Food utilization (rice product, food, and income from non-food products).

The data analysis was used descriptive statistic (mean, standard deviation, percentage, covariance, etc.), and the compare mean analysis was also used to show relationship of characteristics of household food insecurity and impact of household to food insecurity in different farm types. This process was to fulfill an objective 1. As shown in tale 3.3

In order to fulfill the objective 2, the data collection was gathered by interview the household and secondary information from three farm types to explain the five livelihood assets (human, social, natural, physical, and final capital). Moreover, village context such as cropping calendar, historical of household activities were collected data.

The data analysis was used descriptive statistic, and compare mean analysis to compare relationship different farm types and household livelihood assets in three farm types (Table 3.3).

Table 3.7 To compare livelihood assets and food insecurity among different household types

Implementers tools	Types of data
• Group discussion • Household survey	Farmer characteristics: • Household livelihood assets is ➢ Human capital is levels of education, labor skill, and experiences of farmer, and leadership. ➢ Social capital is social relationship, farmers groups, communication, information, and policy. ➢ Natural capital is natural resources such as land, water, forest areas, and biodiversity. ➢ Physical capital is infrastructures, roads, transport, and market. ➢ Financial capital is farmer's ability to earn income, money saving, and financial supporting.

Based on farmer's farming strategies and farm management, which these information could reached the household coping strategies. It could be answered the objective 3 which data collection were gathered from focus group discussion (FGD2) and in-dept-interview households (Table 3.4). The detail of variables of household livelihood assets was shown in Table 3.7

Table 3.8 The variables of household livelihood assets

Variable	Description
Human capital	
Education of farmer	Levels of education 1= non; 2= Primary school up to secondary school (M3); 3= Secondary school (M6)
Farmer's knowledge	Farmer's knowledge 1= poor; 2= Fair; 3=Good
Farmer's skill	Farmer's skill 1=never; 2=some time; 3= Always
Farmer's health	Farmer health 1=poor; 2= medium; 3=Good
Household size	Number of household members
Natural capital	
Natural resource	Natural resources 1=poor; 2= medium; 3=Good
Soil fertility	Soil fertility 1=poor; 2= medium; 3=Good
Physical capital	
Road	Access to road 1=poor; 2= medium; 3=Good
Water supply	Access to water 1=poor; 2= medium; 3=Good
Electricity	Access to electricity 1=poor; 2= medium; 3=Good
School	Access to school 1=bad; 2= medium; 3=Good
Health care	Health care 1=bad; 2= medium; 3=Good
Technical support	Technical support from DAO 1=bad; 2= medium; 3=Good
Information	Village information 1=bad; 2= medium; 3=Good
Social capital	
Rice fund	Farmer rice fund 1=poor; 2= medium; 3=Good
Crop fund	Farmer cash crop fund 1=poor; 2= medium; 3=Good
Financial capital	
Household saving	House saving 1= a little; 2= medium; 3=Good
Loan	Loan bank 1= a little; 2= some time; 3=always
Supporting by Government	Government support 1= a little; 2= medium; 3=Good
Supporting by NGOs	NGOs support 1= a little; 2= medium; 3=Good

Objective 3 To understand the future coping strategies, this described steps in the Figure 3.4. Leek (2007) found that based on the wealth ranking by categorizing the household livelihood into three groups: low, medium and high income. The measuring of household livelihood coping strategies were as follow (Modified: Maxwell *et al*,. 2003; Mjonono *et al.*, 2009) (Figure 3.4). The PAR method were useful for explore the farm historical such as: 1).the time-line and seasonal calendar were used to investigate occurrence of events that relevant to household food insecurity through historical of household livelihood activities (on farm and off-farm). 2).the proportion of household's income and household's expenditure on food obtained from questionnaire survey. These were be used to compute the ratio of cash income and food expenditure in different farm types. There may help explain the household coping capacity to food insecurity.

Table 3.9 Tools and sources of data for future coping strategies to food insecurity

Implementers tools	Sources of data
• Group discussion • Household survey	History of farmer has been facing food insecurity during past two years periods in rubber farming with following data: • Ability to produce rice or able to buy rice, • Able to borrow rice or buy food • Depend on NTFPs as substitution food, • Restrict to daily household consumption food • Selling labour as sources income for buy a food in other rubber farming • Raising livestock for food and source of income • Household expenditure on food

According to information from objective 1 and 2 were combined to identify the most significant keys indicators affecting to household coping strategies (Figure 3.4). To achieve this objective, the PRA-method, focus group discussion was used. Then the result from PRA-method was used as a guideline for in-depth individual household interview and for gathering the data from secondary data (PAFO and DAFO). The

questionnaire was used the keys indicators from PRA-method to observe how the household management to cope their food insecurity in the short-fall and level of household consumption in each different farm type.

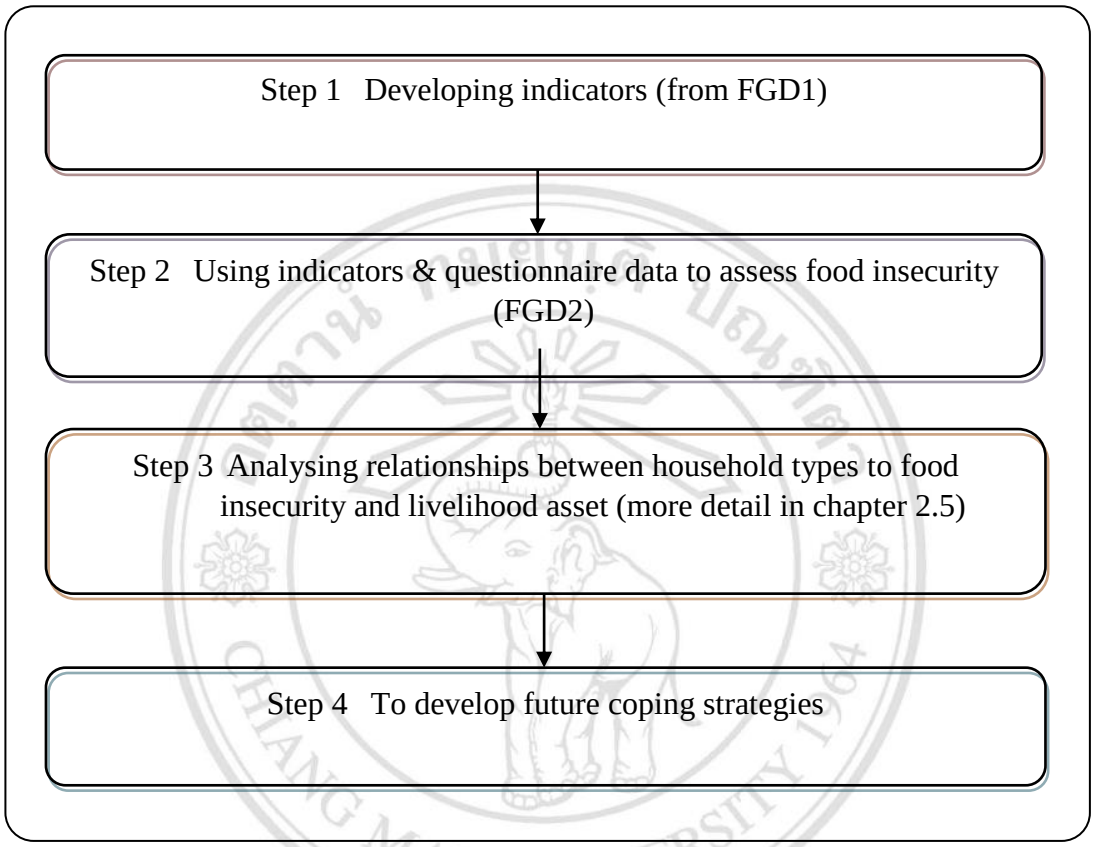

Figure 3.4 Steps of household coping strategies

The results from PRA and questionnaire survey reveal food insecurity indicators and assessment, as well as coping strategies that people have applied in the past, which were presenting to the communities' representatives. This would reach to obverse and discuses the risk context of food security toward multiple future scenarios that could explains for the future coping strategies. The result of this study was very useful when attempting to determine the impact the actual outcome of a particular food insecurity situation and resolve the problems. Whereas, it could be predicted how changes from the past to future respectively. Therefore, it could explain the impact of household food security from each farm types. This reach to develop the scenarios for farmer's adapted coping strategies which has an appropriately in the different farm types. It could reduce the risk context of food insecurity in the future.

3.4 The scope of this study

The study focused on the farmers that transformed from upland rice to rubber farm in Namor district and Xay district of Oudomxay province. This study was considered into three farm types. The smallholder farmer currently engaged in rubber farming and who likely benefit access to land and capital that impacts to natural resources and household's livelihood options. Especially, data collection analyzed the key factors that impacts to household livelihood vulnerability to food insecurity in details. The survey conducted semi-structure questionnaire by interview key persons including village head, farmer focus group, role of gender which was followed in household context such as land size, family size, age of farmer, education and health, household assets and social relationship.