

CHAPTER III

RESEARCH METHODS

3.1 Conceptual framework

The household level food insecurity comprises both on food availability situation and food accessibility. But, these components of food insecurity are determined not only by resources possessed by the households but also by different socio-economic variables. These variables are further affected by the household tertiary level behaviors such as market, community and national level and other enabling conditions. These factors and conditions are found at different level of hierarchies. So, this pattern of relationship can be depicted on the following different hierarchies (Figure 3.1).

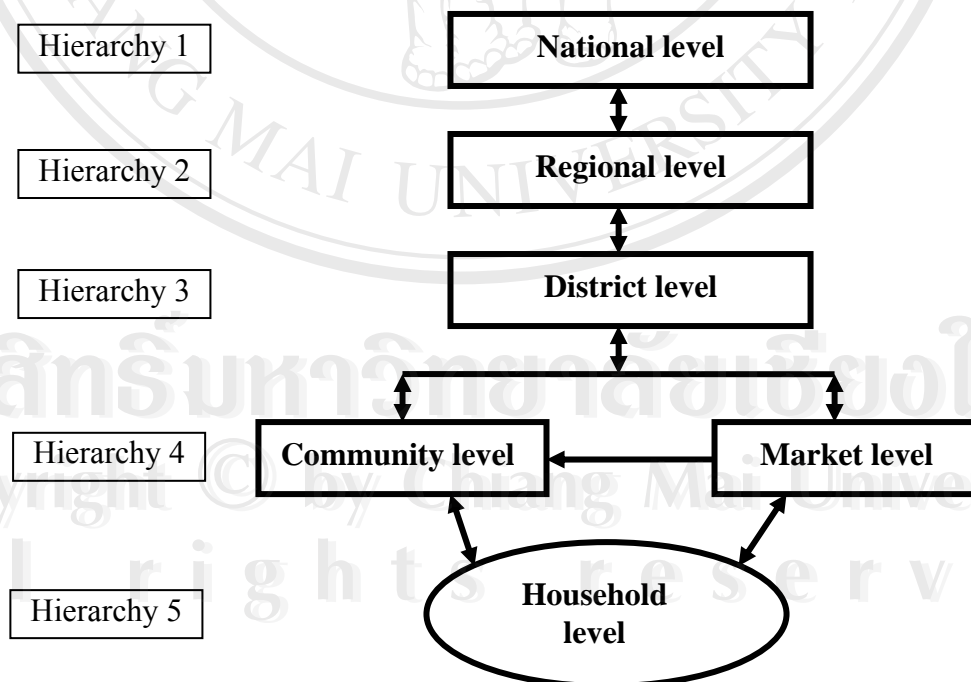


Figure 3.1 Hierarchies of the food insecurity.

While looking at the national level, food insecurity can be caused by the weather failure, big natural disaster and/or may be due to trade sanction. These effects would easily be trickled down to the regional level to the district level to the community level to ultimately to the household level. Additionally, regional policy decisions such as resource distribution for maintaining regional balance would affect to regional level itself and other levels also. Similarly, decisions taken at different levels affect not only the downward but also upward levels also. At the household level, individual household heads' decisions, which are guided by households' traditions, cultural and resource endowments, determine the food security or insecurity of that particular household. Aggregate situations of number of the households in the particular locations or particular caste/ethnic group decisions reveal the community's food situation. At the community level, resource endowment affects food security of that particular community. Additionally, consumption behavior at the household level affects the market level and market forces again affect the households' consumption and community as a whole. The aggregation of food security situation of each community reveals situation at the district level and the aggregation of the district level food situation reflects the regional level and the aggregation of the regional situation reflect the situation of whole country. This is how the household food security or insecurity of one level linked with other levels.

This study has focused its analysis at the household level under different caste/ethnic groups. Within these selected households food insecurity issues differ significantly from one ethnic group to another ethnic group due to their differences on socio-economic variables such as access to resources such as land, credit and expenditure, income and other social variables. These variables ultimately affect to the production decisions of the household. Production decision largely affect to the food access of the households, since most of the people of this district are engaged in agriculture. Study has utilized the following conceptual framework and procedures (Figure 3.2).

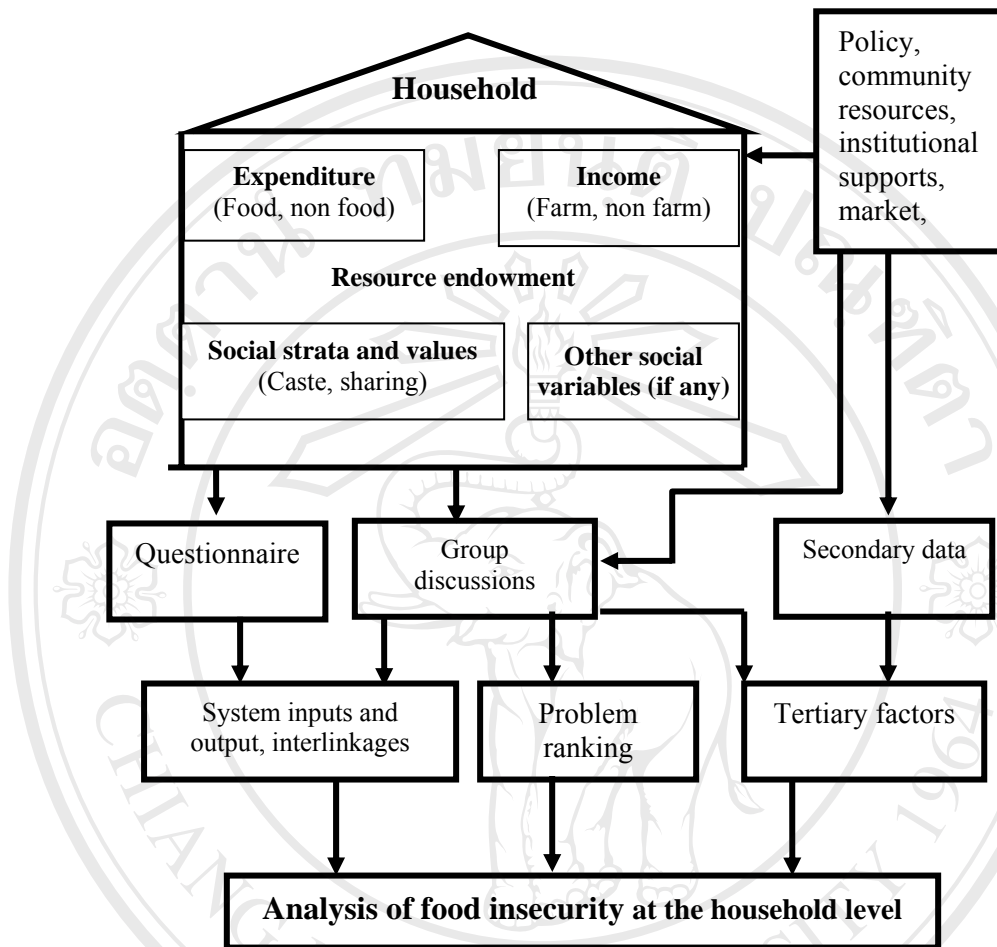


Figure 3.2 Conceptual framework and procedure of studying of household level food insecurity.

Besides, the own socio-economic variables of the household; policy, community resource endowment, institutional support and market are constantly affecting to the household's food access. Therefore, these settings were also captured by secondary data; whereas household's socio-economic variables were collected through direct interviews and group discussions. From primary or secondary or even tertiary factors such as land tenure, education, cultures, policy, access to natural resource, demographic features were captured to some extent in order to describe the food insecurity system as whole.

3.2 Site selection:

The study was conducted in Kailali district of far western development region of Nepal. This district was purposively chosen for the study to see the food insecurity condition where food availability was sufficient at the aggregate level. Besides, this district consists of diverse socio-economic conditions such as caste/ethnic groups, landholding sizes, irrigated condition, access to credit, and access to capital. After the district was decided for study, three Village Development Committee (VDC) namely *Geta*, *Chumala* and *Darakha* were selected randomly.

3.3 Data collection

3.3.1 Household Survey

Basically, agriculture production, income (farm and off-farm income including non farm income), production transfer and access to the resources were captured during data collection. This study had given more focus to socio-economic aspects rather than technical aspect of the food insecurity. On social aspect, *Brahmin*, *Chhetri* and *Sudra* castes from Indo-Aryan group and *Tharu* as another ethnic group were selected for the study. On economic aspect, agricultural and livestock production, income, labor and distributions of economic resources were mainly collected through interviews. Besides, tertiary factors such as education level, market access were also collected. Secondary data were also collected in order to show the trends of area, production and productivity.

Data collection was conducted in multi-stage and multi-criteria basis. Firstly, randomly three VDCs or municipalities were selected. By doing so, three VDCs viz. *Geta*, *Darakha* and *Chaumala* were selected. But, seven northern most VDCs were deliberately excluded from the random sampling, in which data collection was impossible due to insurgency. Secondly, from each VDC one ward was selected randomly. Again from each ward, one village was selected randomly and from each village from three VDCs representative samples from each caste/ethnic groups

selected. By this process, total 90 households were selected for the interviews (Table 3.1). Though the aim was kept equal quota of sample for each caste/ethnic from each VDCs; but that could not be maintained due to unavailability of caste/ethnic group in that particular village. Therefore, during sampling *Tharu*, *Brahmin*, *Chhetri* and *Sudra* castes were selected for interviews. However, one sample under *Gurung* category was collected and later it was removed because there was no possibility to calculate the statistics from that sample. In fact these caste/ethnic groups constitute more 90 percent of the total population of the district.

Table 3.1 Composition of samples from three VDCs of the study area.

Caste/ ethnic group	Village Development Committee (VDC)			Total
	Darakha	Chaumala	Geta	
Brahmin	1	9	9	19
Chhetri	7	4	5	16
Sudra	12	9	6	27
Tharu	8	9	10	27
Gurung	0	0	1	1
Total	28	31	31	90

Source: Survey, 2004

The secondary data were also collected from District Development Committee Office (DDC), District Agriculture Development Office (DADO), District Livestock Development Office (DLDO), Nepal Food Corporation, zonal office (NFC). From DADO the data related to crop production, irrigated area, and market information were collected; whereas from DDC district profile was collected to see the demographic composition, development works and result of some studies/surveys were also collected. From DLDO data related to the livestock were collected. Similarly, from NFC transaction of food (especially export) data were collected.

3.3.2 Group discussion

Three group discussions were conducted in order to capture factors affecting to the food insecurity. These group discussions were conducted in three selected VDCs separately. In each VDC, group discussion was started by dividing the whole group into sub-group based on caste/ ethnic group of the people. In these sub-groups, discussions about the major food items, seasonal calendar on income, expenditure, food shortage and morbidity were held. Later these subgroups were merged in one group in each VDC for the discussion about the problems related with agriculture, major inflows and outflows of food items in the household, time lines of agricultural development and seasonal calendar of labor availability, cropping calendar. Problems were later prioritized by pair-wise ranking. Moreover, major underlying cause of food insecurity was constructed on the rich picture during the each group discussion. The rich picture synthesizes the complexity and interrelationship of the elements in a situation without reducing the amount or kind of complexity experienced (Wilson and Morren Jr., 1990). To construct the rich picture, each participant was asked to major activities and issues and the problems they have faced regarding the food insecurity situations. After that all views of each participant were placed in such a way that linkages were made in order to construct the big picture so that factors affecting food insecurity can be captured as a whole. Besides, key informant survey was also done for the validation of the data in each VDC.

3.4 Analysis

Descriptive statistics was employed to describe the resource distribution on different caste/ethnic groups. In addition to descriptive statistics, correlation and regression was also employed in order to find out the extent of relationships among the different factors of food insecurity and their contribution to the food availability at household level. Student t-test was used to test the significant differences between means of different caste/ethnic groups. Moreover, for the analysis of seasonal food insecurity; seasonal calendar was constructed to show the gap on income, expenditure and food shortage during the different months of a year. Besides, the rich picture was

constructed in order to describe major underlying factors that affect to food insecurity at household level of the district.

In order to distinguish food secured household and food unsecured households, net food availability in terms of adult equivalent (AE) per day was calculated by following equation (modified as suggested by Ojha, 1999).

$$K_a = \frac{K_p - (K_s + K_d + K_l + K_r + K_{pl}) + (K_o + K_b)}{AE * 365} \dots\dots\dots(1)$$

Where,

- | | |
|--|--|
| K_a = Net calorie available for consumption per AE per day | K_r = Calories paid for religious and social obligations |
| K_p = Calorie produced | K_{pl} = Calorie loss during milling and handling |
| K_s = Calorie sold | K_o = Calorie received in kind from off-farm work |
| K_d = Calorie used for seed | K_b = Calorie purchased |
| K_l = Calorie paid in kind to hired labor | AE = Adult equivalent |

The farmers were asked the total output of each crop and livestock produced or carried over. At the same time they had to provide additional information on distribution (sale, kept for seed and livestock given as gift and wages as well as religious uses) of these produces and earning food items in the forms of gift, wages, purchases from the market (see detailed questions in Appendix 1). Therefore, the calories values of each category (i.e. K_p , K_s , K_d , K_l , K_r , K_{pl} , K_o , and K_b) was calculated using formula in equation (2).

$$K_i = \sum \lambda_j \mu_j (1 - \omega_j - \theta_j) K_{ij} \dots\dots\dots(2)$$

Where,

K_i is the calories from the food category i^{th} , $i = p, s, d, l, r, pl, o$ and b

λ_j is the calories values of the food item j^{th} (Appendix 2)

μ_j is the extraction rate of the food item j^{th} (Appendix 3)

ω_j is the waste rate of food item j^{th} (Appendix 3)

θ_j is the rate of other losses food item j^{th} (Appendix 3)

On the other hand, the adult equivalent (AE) household member was calculated using the information on household members at different age group and their adult equivalent coefficients provided by Vega and Fisher (cited in Ojha, 1999) (Appendix 4).

After obtaining net calories available per AE per day per household for consumption, then it was regressed with predefined independent variables in order to find out the significant contributing variables on food availability at the household level. The following model was used for that purpose.

$$K_a = \beta_0 + \beta_1 X_{\text{hhyredu}} + \beta_2 D_{\text{bra}} + \beta_3 D_{\text{tharu}} + \beta_4 D_{\text{sudra}} + \beta_5 X_{\text{loan}} + \beta_6 X_{\text{agexp}} + \beta_7 X_{\text{offincome}} + \beta_8 X_{\text{stkcapital}} + \beta_9 X_{\text{anieqv}} + \beta_{10} X_{\text{disasc}} + \beta_{11} X_{\text{disforest}} + \beta_{12} X_{\text{aev}} + \beta_{13} X_{\text{irriland}} + \beta_{14} X_{\text{parcel}} + \varepsilon_i \dots \dots \dots (3)$$

Where,

K_a	= Net calorie available per day per adult equivalent	β_0	= Intercept
$X_{hhyredu}$	= Years of education of household head	D_{bra}	= Dummy for <i>Brahmin</i> (1 for <i>Brahmin</i> otherwise 0)
D_{tharu}	= Dummy for <i>Tharu</i> (1 for <i>Tharu</i> otherwise 0)	D_{sudra}	= Dummy for <i>Sudra</i> (1 for <i>Sudra</i> otherwise 0)
X_{loan}	= Loan amount	X_{agexp}	= Expenditure in agriculture
$X_{offincome}$	= Off- farm income	$X_{stkcapital}$	= Stock of capital
X_{anieqv}	= Animal equivalent unit	X_{aev}	= Adult equivalent
X_{disasc}	= Distance from agriculture service center	$X_{disforest}$	= Distance from forest
$X_{irriland}$	= Irrigated land area	ε	= Error term
β_s	= Coefficients of variables		

Significant coefficients were identified by utilizing t-test among the list of variables; whereas contribution of the respective factors was compared by standardized coefficient. According to the prior expectation, households head's years of education, loan amount, expenditure in agriculture, off-farm income, stock of capital, animal equivalent unit and irrigated land area were supposed to have positive contribution on food availability; whereas distance to agriculture service center, adult equivalent were expected to have negative relationship with food availability.