Chapter III

Research methods

3.1 Research approach

This study has used both qualitative and quantitative approaches of scientific inquiry to explore the answers of the stated objectives in Chapter one. The main exploration of this study is based on qualitative analysis using structured questionnaire survey. Within the qualitative framework, key informant and focus group methods are used to understand the trends in social capital stock over time through perceptual understanding of trends in its six expressions. The structured rank scale questionnaire survey tool is used within the quantitative framework to measure the social capital stock and performance of vegetable production program in selected sites. Further, regression analysis is used to understand the role of social capital in performance of the vegetable production program.

This study has focused on the household and community level assessment of social capital. The households in communities are considered as basic unit of social capital accumulation and erosion. Generally, trust accumulates reciprocity flows, proactivity and collective action emerges and social norms are enforced to shape the behavior of the members at the household level. In the social capital literature, Putnam (1995) stated that 'the most fundamental form of social capital is the family'and Fukuyama (1999) asserted that families are obviously important sources of social capital everywhere. Within this literal background household is selected as unit of social capital study.

3.3 Selection of social capital dimensions

Social capital is elusive multidimensional term and it is measured through different manifestations in communities or using its expressions as proxy measures. After rigorous literature review on expression of social capital and proxy measures used for its estimation at different level, six important dimensions 1) networks, 2) trust, 3) reciprocity, 4) proactivity, 5) collective action and cooperation and 6) social norms are selected to measure the social capital stock in farming communities (Figure 3.1). The detail of these social capital dimensions were described in Chapter two.

The measurement criteria used for one community do not apply for another community with different socio-cultural and economic settings. In Nepalese context, farming communities does not possess formal networks and other kind of formal civic engagement so it cannot be used as proxy measure of social capital. Similarly, political participation, voter turn out, density of civic organizations, tax compliance, diversity acceptance and some others used by different authors are found irrelevant in the context of farming communities in study area. Further communities are mostly uniform hamlets composed of dense network of family clans and kinship and acceptance of diversity that cannot be used as proxy measure of social capital in such case.

The selected six dimensions are central in rural agrarian livelihood framework and their status can be used as close proxy of existing stock of social capital. Generally rural farming communities are self-contained hamlets where informal kinship networks, trust and reciprocity are of paramount importance for their sustenance and livelihood. The informal community rules and norms of reciprocity have strong influence in behavior of individuals in the community also important. Secondly, collective action and cooperation in farm and other activities, proactivity in common benefit works are basic ingredients in community life. The community resilience is largely based on networks, trust, reciprocity and collective action and cooperation among the members in the community. The six expressions selected here are complementary to each other. The networks are strong where there is enough trust

in such networks. The reciprocity occurs and collective action evolves through trust worthy networks. Within this social background above mentioned six expressions are selected as a measure of social capital in farming communities.
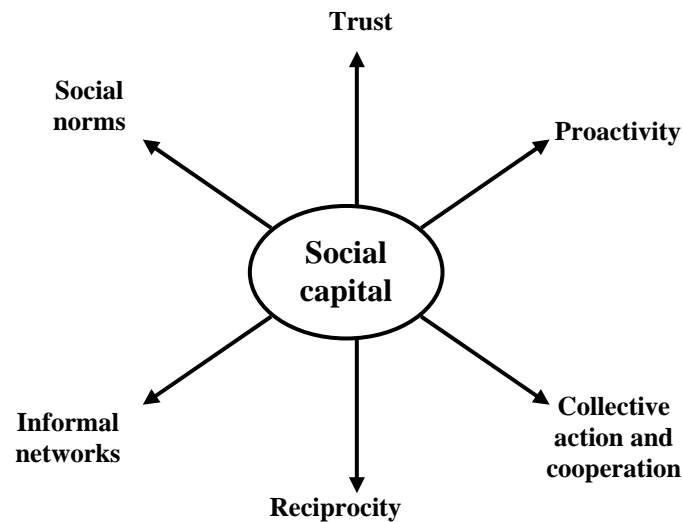

Figure 3.1 Selected social capital dimensions

3.4 Site selection and sampling

The six districts from far Western development region, namely Darchula, Baitadi, Dadeldhura, Doti, Kailali and Kanchanpur were selected purposively for the study (Figure 3.2). The vegetable production program is being carried out in these districts by the government agencies (mainly by the district agriculture development offices) since more than three years. Twenty vegetable production sites from these districts in which program have already crossed two years were selected to carryout the field survey. The studied sites in each district were selected purposively.

- Darchula – 3 sites (Khalanga, Chappari, Bhagwati)
- Baitadi – 5 sites (Dasrath Chand Municipality, Kumali Deval Hat, Dehimandu, Gurukhola, Siddhaswor)
- Dadeldhura –3 sites (Amargadi, Bhatkanda, Jogbuda)

- Doti – 1 sites (Dipayal)
- Kanchanpur– 3 sites (Dodhara, Tilachaud, Suda)
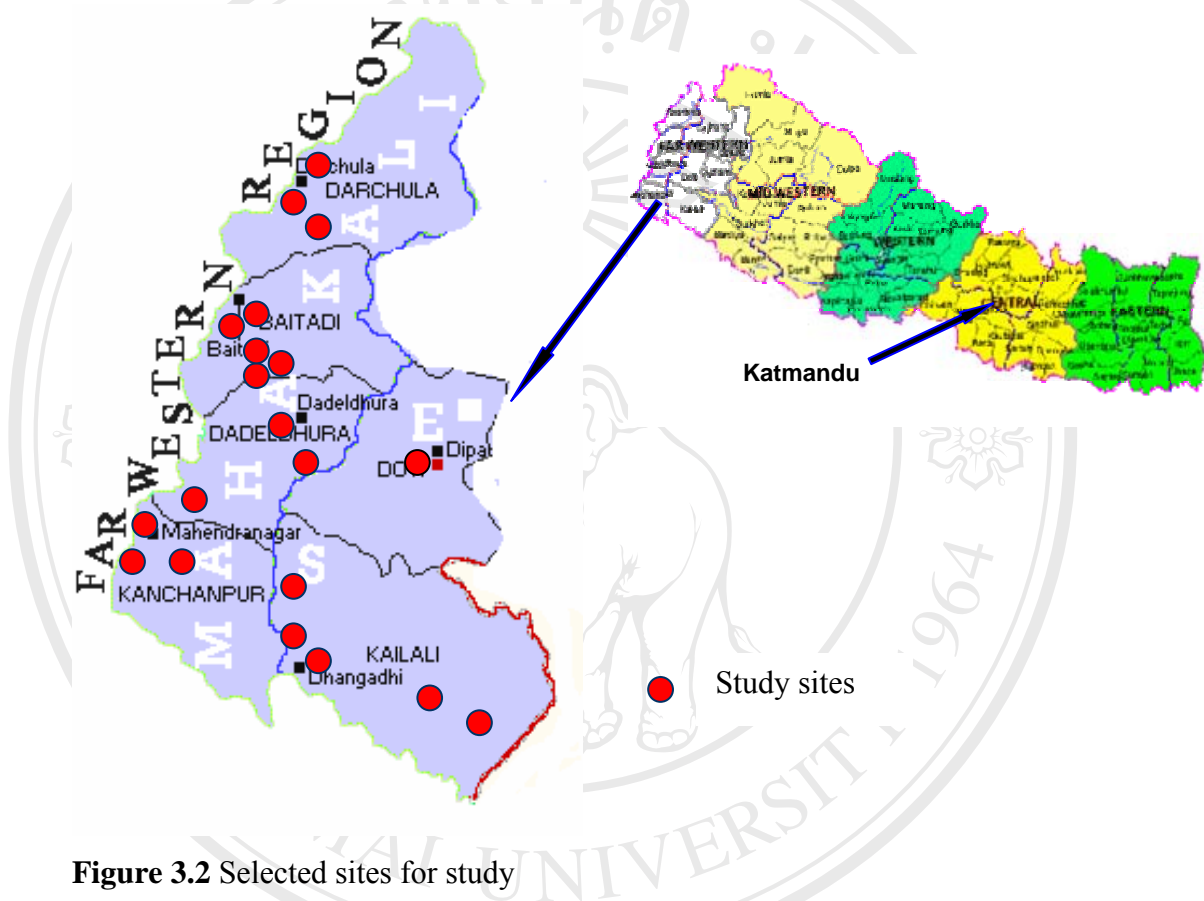- Kailali – 5 sites (Dhangadi Municipality, Geta, Malakheti, Pratappur,Tikapur)

Figure 3.2 Selected sites for study

3.5 Survey questionnaires

The rank scale (Likert scale) questionnaires were constructed for household survey to measure the expressions of social capital and collect information about the performance of vegetable production program. The questions under each dimension were constructed carefully to capture the local ways of social capital manifestation. It is assumed that single question can not measure closely the level of selected dimension and one dimensions of social capital has different distinct faces which cannot be covered by single question. For example, the question that related to bonding network of the household in the community does not give idea about the

linking networks. This difficulty is solved through using four to five questions to measure each dimensions of social capital expression (Appendix-3.1).

The questionnaires for the measurement were adapted from extensive literature review (Grootaert *et al*. 2003., Onyx and Bullin, 1997., and Krishna, 2004). Further the questionnaires were designed based on the basic knowledge about the farming communities in study area.

3.6 Data collection

Data were collected from both primary and secondary sources to complete the study. Information regarding social capital, vegetable production and other socio economic characteristics of farm families were collected directly from household survey. Other information's about trend of social capital dimensions in rural farming communities were obtained from focus group and key informant discussion. Secondly the data regarding performance of vegetable farming were collected from district agriculture offices and other relevant sources. The published and unpublished documents of concerned governmental and nongovernmental organizations at different levels were the sources of secondary information for the study.

3.6.1 Weighting social capital dimensions and questions

The selected six dimensions of social capital were weighted using Analytical Hierarchy Process (AHP) procedure to make the index of social capital (Figure 3.3). AHP is one useful tool for qualitative judgments in multi criteria decision models. It formalizes and renders systematic what is largely a subjective decision process and as a result facilitates "accurate" judgments (Alphonce, 1997). Social capital is one multidimensional concept and the relative importance of each dimension can be understood well by using the AHP in particular social context. The social capital is at the top of the problem hierarchy and six dimensions as criteria's in at second level. Thus two hierarchy AHP was used to assign the weight to six dimensions of social capital. It provides the idea about relative importance of social capital dimensions in particular social context.
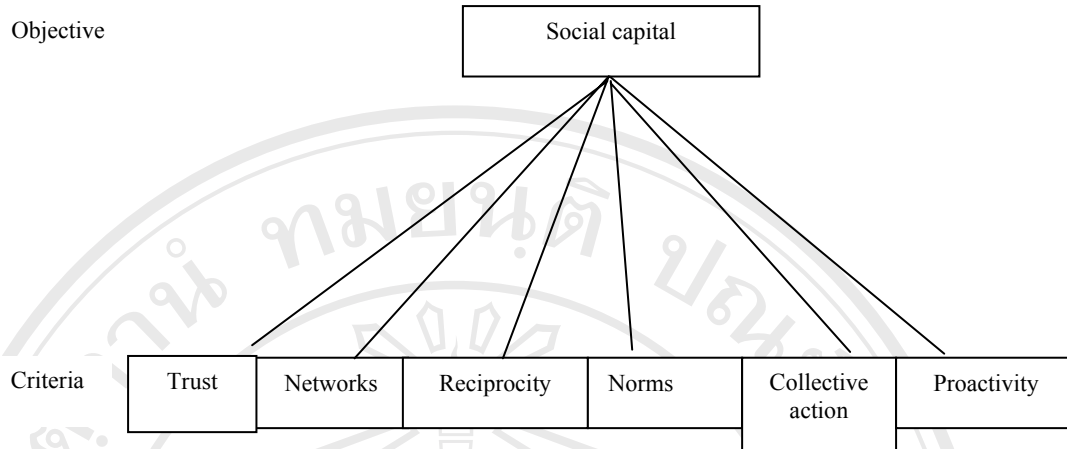
Figure 3.3 AHP process for weighting social capital dimensions
Source: Adapted from Alphonce, 1997

The weight was assigned through group discussions involving agricultural officers available at Agriculture Development Office and three farmers from the selected sites, using the AHP process. The researcher worked as facilitator during the discussions. At first, the concept of social capital was discussed to make the clear understanding among group. The six dimensions were weighted against each other based on relative importance perceived by individuals using pair wise ranking procedure and final weight for each dimension was obtained. The nine-point scale was used for pair wise comparison of the social capital dimensions (Table 3.1).

Table 3.1 Nine point scale for pair wise comparison

Importance	Definition	Explanation
1	Equal importance	Two elements contribute identically to the objective
3	Weak dominance	Experience or judgment slightly favors one element over another
5	Strong dominance	Experience or judgment strongly favors one element over another
7	Demonstrated dominance	An element's dominance is demonstrated in practice
9	Absolute dominance	The evidence favoring an element over another is affirmed to the highest possible order
2,4,6,8	Intermediate values	Further subdivision or compromise is needed

Source: Alphonce , 1997

Each dimension of social capital is considered as criteria and social capital as the objective in AHP (Figure 3.3). The assigned weight shows the relative importance of six expressions in farming as social resource representing stock of social capital. The consistency ratio was calculated to test the consistency of assigned weights. The detailed process of weight calculation is mentioned in Appendix 3.2.

Secondly, there were 4 -5 questions under each of these dimensions and it was assumed that all the questions did not carry equal contribution in measurement of the selected dimension. The questions under the dimension were considered as criteria's and the respective dimension as the objective in AHP. The pair wise comparison for each question was made to judge how closely the particular question measures the level of particular dimension of the social capital at the household level. The same procedure used to weight six dimensions of social capital was used to weight the questions under each dimension (Figure 3.4).
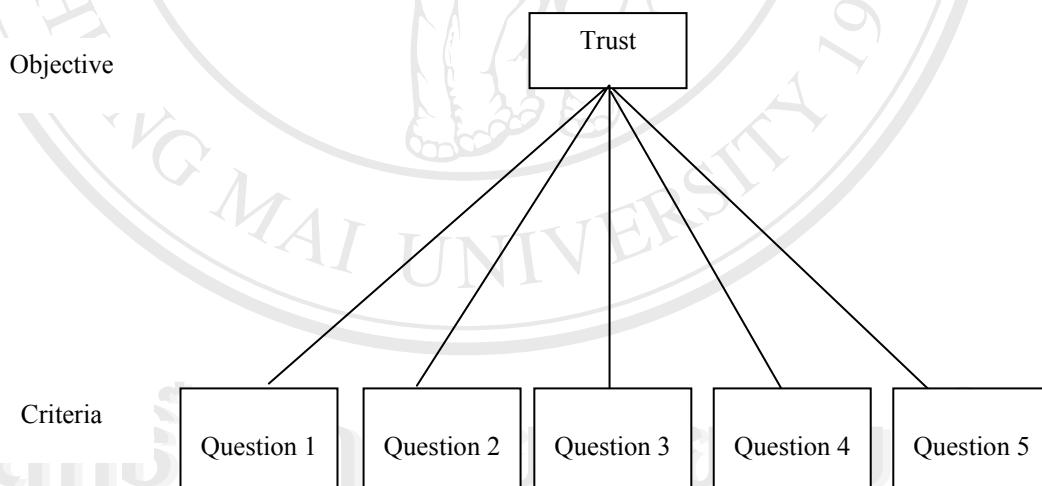
Objective   Trust

Criteria   Question 1   Question 2   Question 3   Question 4   Question 5

Figure 3.4 AHP process for weighting questions under trust dimension

Source: Adapted from Alphonce, 1997

3.6.2 Household survey

Seven to nine households from each site were selected randomly from site profile available at the district agriculture development offices. The total numbers of 162 households were selected for the study from above mentioned twenty sites. The

structured questionnaires were used to collect the detailed information from the sampled households. The enumeration was carried out with household heads, responsible for overall household decision making. Farm households in the farming communities do not have any record keeping system so all the information collected were based on human memory retrieval of the respondents.

3.6.3 Focus group discussion

The four focus group discussions were organized with participants above fifty years of age to know their perception about the changes in different dimensions of social capital during last thirty years. The time frame of 30 year was taken in consideration for learning participants perceptions on trends in each social capital dimension.

3.7 Data analysis

The data were analyzed using the SPSS software (Version 14) and Microsoft EXCEL spreadsheet. Mainly, analysis was focused on general socioeconomic features of the population, calculation of social capital dimensional indices, calculation of social capital index, and performance measure of vegetable production program at household and community level. The distribution of social capital index is compared with different communities, caste categories, income groups, land holding sizes and other socio economic characteristics to know the variation in social capital among these groups and geographical settings.

3.7.1 Social capital index construction

The individual index of six dimensions of social capital is prepared using the weighted questionnaires under each dimension at household level. Analytical Hierarchy Process was applied to assign the weight for questions under respective dimension (Appendix 3.2). The household level indices are averaged to get site level indices of social capital and its dimensions. The following steps were followed to

construct the social capital index. The value of the index shows the level of social capital endowment at household level in communities.

Construction of dimensional indices: There are four to five questions under each dimension and each question has 4-5 options. These questions measure different aspect of the dimensions. The weight is assigned to each question by using the AHP technique. For example, there are five questions in network dimension these questions measure different aspects of the network. The assigned weight shows the relative importance of the question to measure the status of particular dimensions of social capital. Further, the weight assigned to each question provides basis to combine these questions to a summary measure of network at household level. The flowing steps were followed to make the index of particular dimension.

Step-1: The options under the question were arranged highest to lowest rank, for example in the following question. For this question the options were ranked from lowest one to highest four. This 1-4 scale is converted to 0-1 scale to make similarity for all questions. For example, when option 1 is selected it has given a number equal to 1, 2, 0.75, 3, 0.50 and 4 equal to 0.25 respectively.

Trust question-1: In general speaking how many people in the community could be trusted?

□ All the people with some exceptions □ More than half of the people □ Half of the people □ Very few people

Step-2: Before combining all the questions, the 0-1 scale score of each question is multiplied by the weight of the question (obtained from AHP). Suppose assigned weight for question 1 under trust dimension is X and Y is normalized score (0-1scale) for the question then the converted value for question 1 is:

TQ_1 value = X*Y

TQ_1 = Trust question 1

Suppose the assigned weight (X) for the question one (from AHP) under trust dimension is 0.25.

TQ_1 value = 0.25*0.25

$$= 0.625$$

Similarly the converted value of each question under trust dimensions is obtained. The value for all questions under trust dimension is summed to get the trust index.

$$T_{Index} = TQ_1value + TQ_2value + TQ_3value + TQ_4value + TQ_5value$$

Similarly network, collective action and cooperation, reciprocity, proactivity and social norms index were constructed separately.

Construction of social capital index: The six dimensions selected as a measure of social capital were weighted using AHP technique based on their relative importance for individual as well as community wellbeing and a community to be considered as a good community. Analytical Hierarchy Process (AHP) is used in the premises that all six dimensions of social capital do not carry equal value for the community households. For example reciprocity is more important than collective action for a community household. Index of each dimension was multiplied by assigned weight and final index of social capital is obtained by adding those values of six dimensions.

The normalized weight of trust index = $T_{Index} * W_t$

Here W_t is assigned weight to the trust dimension from AHP process.

Example: When the trust index is 0.625 and the assigned weight (W_t) is 0.20

The normalized weight of trust index = 0.625*0.20

$$= 0.1250$$

The social capital index is obtained as

Social capital index = $T_{Indx} * W_t + N_{Indx} * W_n + C_{Indx} * W_c + R_{Indx} * W_r + P_{Indx} * W_p + S_{Indx} * W_s$

Outside the social capital index, analysis is made to understand the status of different micro expressions of social capital. This analysis has focused on different type of networks, trust and trust radius, social norms, reciprocity and collective action at household as well as community level.

3.7.2 Performance measures of vegetable production program

The performance of vegetable production program can be analyzed in different ways e.g. level of commercialization, increased income of the household, community participation, annual transaction of the output, farmers group functioning, developed marketing system, efficiency in service delivery, equity regarding gender and poor category of members and others. Here in this study, the performance of vegetable production program is analyzed at household and community level using some selected measures.

3.7.2.1 Household level performance

The vegetable production adoption index (scale of adoption of vegetable farming) and income index are selected as household level performance measures. The adoption index measures what proportion of potential land suitable for vegetable cultivation is utilized by the household for vegetable farming and income index measures the contribution of income from vegetable farming to gross annual farm income of the household. These two indices are calculated as:

$$Adoption \;\; Index \;(AI) = \frac{Existing \;\; area \;\; under \;\; vegetable \;\; crops \;(ha)}{Total \;\; potential \;\; area \;\; for \;\; vegetable \;\; crops \;(ha)}$$

$$Income \;\; Index \;(II) = \frac{Gross \;\; annual \;\; income \;\; from \;\; vegetable \;\; crops \;(NRs)}{Gross \;\; annual \;\; income \;\; from \;\; all \;\; crops \;(NRs)}$$

3.7.2.2 Site (community) level performance

The performance of vegetable production program could be either measured using three separate or one combined measure. The three performance measures are community participation, average adoption of vegetable farming and women's participation in groups. It is known that wider participation of the community people in the program indicates better performance of the program in terms of vegetable production and marketing. The higher average adoption index indicates the acceptance of the vegetable production as income generating enterprise by the

community households. The third performance measure selected is women's participation in group measures the gender equity and women's empowerment. These performance measures are calculated as:

$$Community\ Participation\ Index\,(CPI) = \frac{Nmmber\ of\ household\ organized\ in\ groups}{Total\ household\ in\ community}$$

$$Average\ Adoption\ Index\,(AAI) = \frac{Average\ area\ of\ vegetable crops\ per\ household\,(ha)}{Average\ potential\ area\ per\ household\ for\ veg.\,crops\,(ha)}$$

$$Womens\ Participation\ Index\,(WPI) = \frac{Total\ female\ members\ in\ groups}{Total\ group\ members}$$

These three measures are weighted to construct a single measure of performance. This measure is considered as program performance index. The weight is assigned judiciously. The household participation in groups is fundamental to produce momentum in the program and it is assigned with 0.35 weight. Secondly adoption of the vegetable production is core progress of the program. Only community participation does not produce outcome, average adoption rate of vegetable farming in the community is the most important measure. By this reason adoption index is thus assigned with 0.45 weight. Finally women empowerment and gender equity is government priority to reduce gender disparity and it is assigned with 0.20 weight. Thus the program performance index is constructed as:

$$Program\ Performance\ Index\,(PPI) = 0.35CPI + 0.45AAI + 0.20WPI$$

3.7.3 Regression analysis

The linear regression models are conceptualized for analyzing contribution of social capital to vegetable production performance at both household and community level. It is hypothesized that many social and physical resources owned by the household, infrastructure and support services available in the program sites govern the performance outcomes of the program. The main purpose of these models is to understand the role of social capital variables in the program performance.

3.7.3.1 Household level performance model

In order to know role of social capital adoption of vegetable farming by the household, regression of Model-1 is employed.

Model-1

$$Adoption\ Index\ (AI) = f\ (DFS, BNET, DGS, DC, DB, DS, DET, DM,\ LNET, ELFH,$$
$$TGO, TT, THT, RL, RSB, GR, LHS, GGN, GC, MD, \varepsilon_i)$$

$$\ldots\ldots\ (i)$$

Dependent variable – Adoption index of vegetable farming (AI)

Independent variables

- Household food self sufficiency (DFS) – Dummy variable: 1 if household is food self sufficient, 0 otherwise
- Bonding network (BNET) – Numeric variable value from 0-1
- Government support (DGS) – Dummy variable: 1 if household got any government support, 0 otherwise
- Four dummy variables for five caste categories in the model. Bhramin was selected as reference category.
  - Dummy for Chettri (DC): 1 if household is Chettri , 0 otherwise
  - Dummy for Baisaya (DB): 1 if household is Baisaya, 0 otherwise
  - Dummy for Sudra (DS): 1 if household is Sudra , 0 otherwise
  - Dummy for ethnic tribe (DET): 1 if household is ethnic group, 0 otherwise
- Migration status (DM) – Dummy variable: 1 if household is migrant within last five years, 0 otherwise
- Linking networks (LNET) - Numeric variable value from 0-1
- Education level of the family head (ELFH)- Numeric variable value in number of years of schooling
- Trust in government officials (TGO) – Numeric variable value in 0-1 scale
- Thick trust (TT) – Numeric variable value in 0-1 scale
- Thin trust (THT) - Numeric variable value from 0-1
- Reciprocity of labor (RL) - Numeric variable value from 0-1

- Reciprocity of seeds and breeds (RSB)- Numeric variable value from 0-1
- General reciprocity (GR)- Numeric variable value from 0-1
- Land holding size (LHS) – Value in ha
- General ethical norms(GGN)- Numeric variable value from 0-1
- General cooperation (GC)- Numeric variable value from 0-1
- Distance from market center (MD) – Value in kilometer (km)

Model-2

$Income\ Index\ (II) = f(LHS, TT, MD, AR, SCI, EAVC, \varepsilon_i)$ ……………..(ii)

Dependent variable - Income index for vegetable farming (II)

Independent variables

- Land holding size (LHS) – Value in ha
- Trust to traders (TT) – Value 0-1
- Market distance (MD) – Value in Km
- Access to road (AR) – Dummy variable: 1 if yes, 0 otherwise
- Social capital index at household level (SCI_h) – Value from 0 – 1
- Existing area under vegetable crops (EAVC) – Value in ha

3.7.3.2 Community level performance models

Three separate linear regression models are constructed to understand the role of social capital on performance of program in different sites (Model 2 to Model 4). Secondly fourth linear model (Model 5) is constructed for the combined performance measure of the program.

Model-3

$CPI = f\ (SCI_c, MD, MA, IA, APLVF, ALHS, AAOI, TT, TGO, \varepsilon_i)$ ………………(iii)

Dependent variable – Community participation index (CPI)

Independent variables

- Social capital index at community level (SCIc) – Value from 0 – 1

- Distance from market center (MD) – Value in kilometer (km)
- Market access (MA) – Dummy variable: 1 if yes, 0 otherwise
- Input availability (IA) – Dummy variable: 1 if yes, 0 otherwise
- Average potential land for vegetable farming (APLVF) – Value in ha
- Average land holding size (ALHS) – Value in ha
- Average annual off farm income of the household (AAOI) – Value (NRs)
- Average trust level to traders (TT) - Value from 0 -1
- Average trust level to government officials (TGO) - Value 0-1

Model-4

$$AAI = f \ (SCI_c, ALHS, AAOI, LR, WPI, IA, TGO, TT, \varepsilon_i) \ \dots\dots\dots\dots\dots\dots\dots\dots \ \text{(iv)}$$

Dependent variable – Average adoption index (AAI)

Independent variables

- Social capital index at community level (SCIc) – Value from 0 – 1
- Average land holding size (ALHS) – Value in ha
- Average annual off farm income of the household (AAOI) – Value (NRs)
- Literacy rate (LR) – Value in percentage
- Women's participation index (WPI) – Value from 0-1
- Input availability (IA) – Dummy variable: 1 if yes, 0 otherwise
- Trust to government officials (TGO) – Value from 0-1
- Trust to traders (TT) – Value from 0-1

Model-5

$$WPI = f \ (SCI_c, ALHS, AAI, FLR, TGO, AAOI \ \varepsilon_i) \ \dots\dots\dots\dots\dots\dots\dots\dots \ \text{(v)}$$

Dependent variable – Women's participation index (WPI)

Independent variables

- Social capital index at community level (SCIc) – Value from 0 – 1
- Average land holding size (ALHS) – Value in ha
- Average adoption index (AAI) – Value from 0-1
- Female literacy rate (FLR) – Value in percent

- Trust to government officials (TGO) – Value from 0-1

- Average annual off farm income of the household (AAOI) – Value (NRs)

Model-6

$$PPI = f(SCI_c, MD, MA, IA, ALHS, LR, AAOI, TT, TGO \ \varepsilon_i)$$ …………………… (vi)

Dependent variable – Program Performance Index (PPI)

Independent variables

- Social capital index at community level (SCIc) – Value from 0 – 1

- Distance from market center (MD) – Value in kilometer (km)

- Market access (MA) – Dummy variable: 1 if yes, 0 otherwise

- Input availability (IA) – Dummy variable: 1 if yes, 0 otherwise

- Average land holding size (ALHS) – Value in Ha

- Literacy rate (LR) – Numeric variable value in percentage

- Average annual off farm income of the household (AAOI) – Value (NRS)

- Trust to traders (TT) – Numeric variable value from 0-1

- Trust to government officials (TGO) – Numeric variable value from 0-1