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Summary of Baseline Household Survey Results: Rupandehi, Nepal

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Abstract

This report provides a summary of the main results of a household baseline survey carried out in early 2011in 7 villages, with 137 households, in the Rupandehi CCAFS site in Nepal. The survey was carried out using the standardized CCAFS household baseline tool.

The results show that most households in Rupandehi produce a multitude of crops. The rice-wheat cropping pattern predominates in this area and many farmers integrate livestock such as cows and buffaloes with crops. Agricultural work on their own farms is shared by multiple members of the households, while men are more responsible for off-farm work. There are varied sources of income within the site, although almost one fifth of households do not have an off-farm source of cash. Many of the surveyed households in Rupandehi reported adopting new crops or varieties in the last 10 years and making cropping and soil related changes. Varietal changes could be observed mainly in rice and wheat, two very important crops for almost all farmers in this area. Changes in regards to livestock keeping practices, however, were not widespread.

In terms of food security, many households in Rupandehi are food secure throughout the entire year. On-farm production provides the majority of the diet. Some households need to procure food from off-farm sources, particularly during the months of July, August and September. The area possesses highly productive soils for rice and wheat and it is considered a production bowl for Nepal, supplying large amounts of rice and wheat to the neighbouring districts.

Land holdings in the site are small; almost 50% of the surveyed households were marginal farmers (<1 ha) followed by smallholders (1-2 ha) and medium holder farmers (2-5 ha). The area is characterized by having irrigation facilities in a substantial number of farm households (93%). Use of agricultural inputs was universal, with many households using more than one type of fertilizer on their crops. Households also place great value on their livestock and purchase veterinary medicines when necessary.

The survey shows that radio, TV, bicycle and cell phones are very common assets in this area. A majority of households receive electricity from a grid. Based on the index we constructed, more than three quarters of the surveyed households fall in the high level of asset ownership.

Keywords

Nepal; baseline; survey: household; livelihoods, agricultural production

About the authors

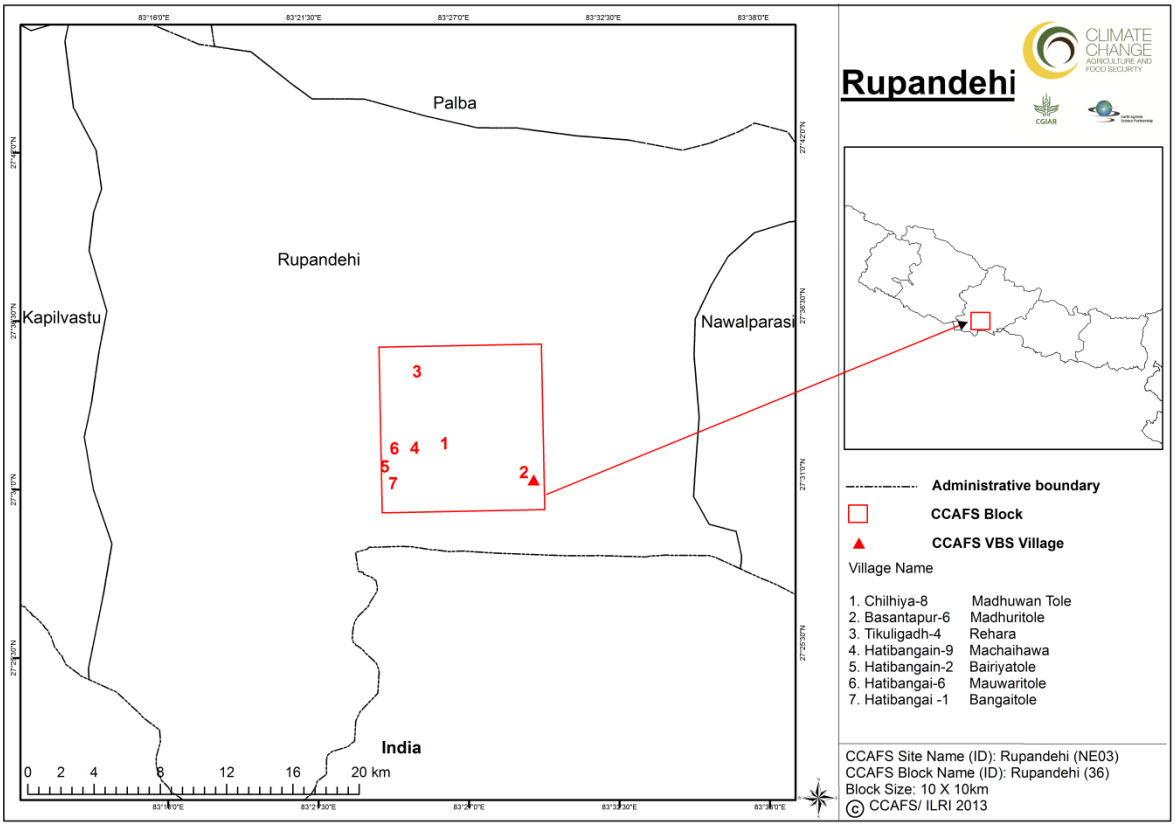
The **Center for Environmental and Agricultural Policy Research, Extension and Development** (CEAPRED) is a non-profit, non-political, and non-government organization established in April 1991. It is registered at the District Administration Office, Lalitpur and has affiliation with the Social Welfare Council and the NGO Federation of Nepal. The Center is a value-based organization committed to promote human-centered sustainable development.

Contents

1.0 Introduction

This report presents the results of an analysis of the CCAFS household baseline survey which was carried out on 9th January to 17th January, 2011 in 7 villages. The survey covers 137 households in Rupandehi district of Nepal (see Figure 1.1). The objective is to capture some of the diversity in the landscape, across communities and households. We are aiming for sufficient precision in some of these indicators to capture changes that occur. Study site, blocks, village selection as well as household samples were drawn following the methodology and sampling framework suggested in the CCAFS Baseline Survey Manual (available at http://ccafs.cgiar.org/resources/baseline-surveys). The survey process and team are described in Appendix 1.

Figure 1.1: Map of Rupandehi site location



This survey was expected to gather baseline information at the household level about some basic indicators of welfare, information sources, livelihood/agriculture/ natural resource management strategy, need and use of climate and agriculture related information and current risk management, mitigation and adaptation practices. The same survey was carried out in very diverse locations and countries (East Africa, West Africa and in other sites in South Asia). The plan is to revisit these households after 5 and 10 years to monitor:

- Changes in assets particularly assets that help farmers to adapt climate variability and change
- Adaptation of communication/technologies such as storage facilities, water harvesting/ storage etc

- Changes/diversification in livelihood options, sources of income and food security
- Changes in crop, livestock and other agricultural practices
- Changes in adaption of new soil/water management practices etc

The household level baseline study report covers the brief summary results of the survey which was carried out in Rupandehi block of Nepal in mid-January 2011. The questionnaire was categorized into the following ten sections:

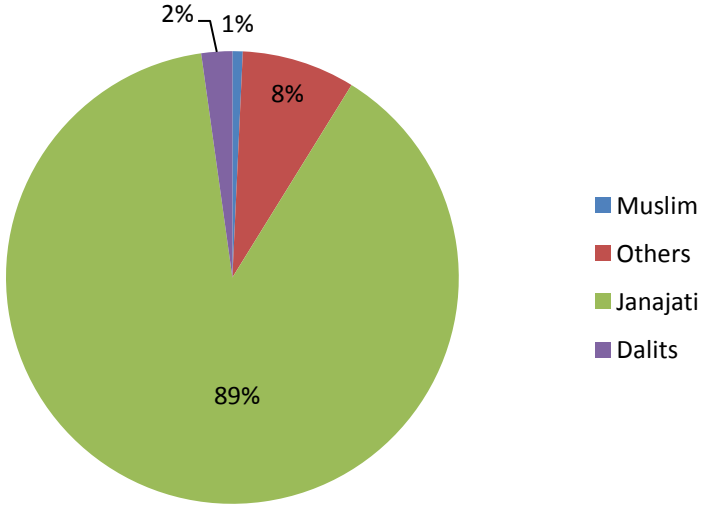
1. Household respondents and types
2. Demography
3. Sources of livelihood security
4. Crop, farm animals
5. Food security
6. Land and water management
7. Input and credits
8. Climate and weather information
9. Community groups
10. Assets

1.1 Household Types and Respondents

Twenty-six percent of the total respondents in the block were female and 74% were male. In the survey area, women were found to be more responsible for doing household chores and men had casual employment outside the village but mainly involved in their own farm lands. Nearly all households (133 out of 137) were male-headed households.

The enumerators mostly found and interviewed male household members. This is because women generally do not want to be exposed to outsiders or are not allowed to talk to newcomers in the presence of male members. In the absence of male members, female were less hesitant to answer the enumerators. Therefore, the number of male respondents is higher than the female ones in the survey block. Household ethnicity data show that 89% of households are members of the Janajati community (Figure 1.2).

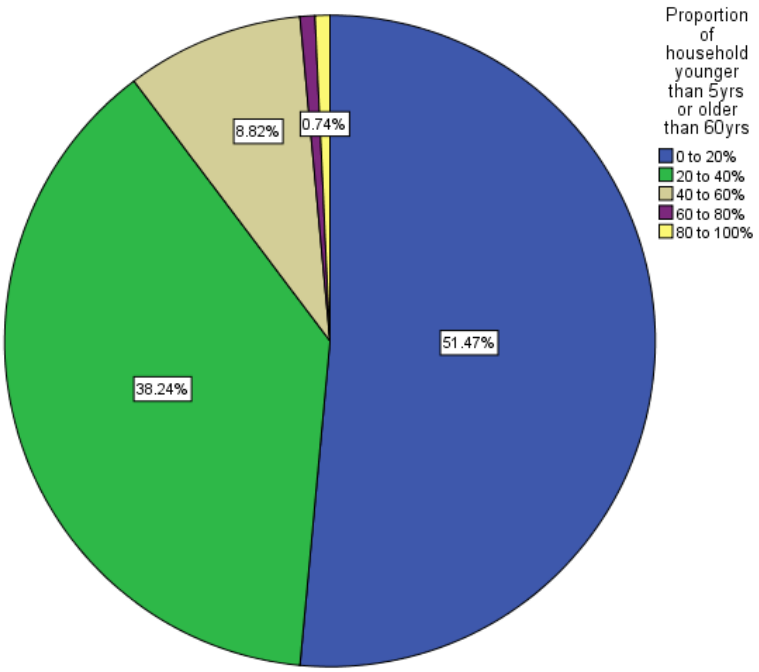
Figure 1.2: Household Ethnicity and Caste



2.0 Household Demographics

The median size of the surveyed households in Rupandehi is 9 people. Figure 2.1 below shows the percentage of non-working age household members (those younger than 5 years or older than 60 years of age) within the surveyed households. Most households have more members of working age than non-workers, as seen in the green and blue section of Figure 2.1.

Figure 2.1 Proportion of the household that is of non-working age



2.1 Education Levels

The following table (2.1) shows that in 75% of households there was someone who had obtained a secondary education or beyond. Only 2% of households had no one with some formal education.

Table 1.1: Levels of education

Highest level of education of any resident household member	Number of households	% of households
No formal education	3	2
Primary	31	23
Secondary	71	52
Post-secondary	32	23
Total	137	100

3.0 Sources of Livelihoods

3.1 On-Farm Livelihood Sources

Table 3.1 and Figure 3.1 show the diversity in production, consumption and selling of different types of agricultural products. It was found that 97% of households are producing food crops while only 10% of them produce some type of cash crop. Similarly, 78% of households are producing fruits and 88% of households produce vegetables on their farms.

Data on livestock production in the surveyed areas reveal that 75% of households are raising small livestock (goats, chickens), and 82% of households are raising large livestock (cattle and buffalo). Of these, 68% of households produce some kind of livestock products such as eggs or milk. Also, 36% of households produce timber on their land and 66% of households produce fuel wood.

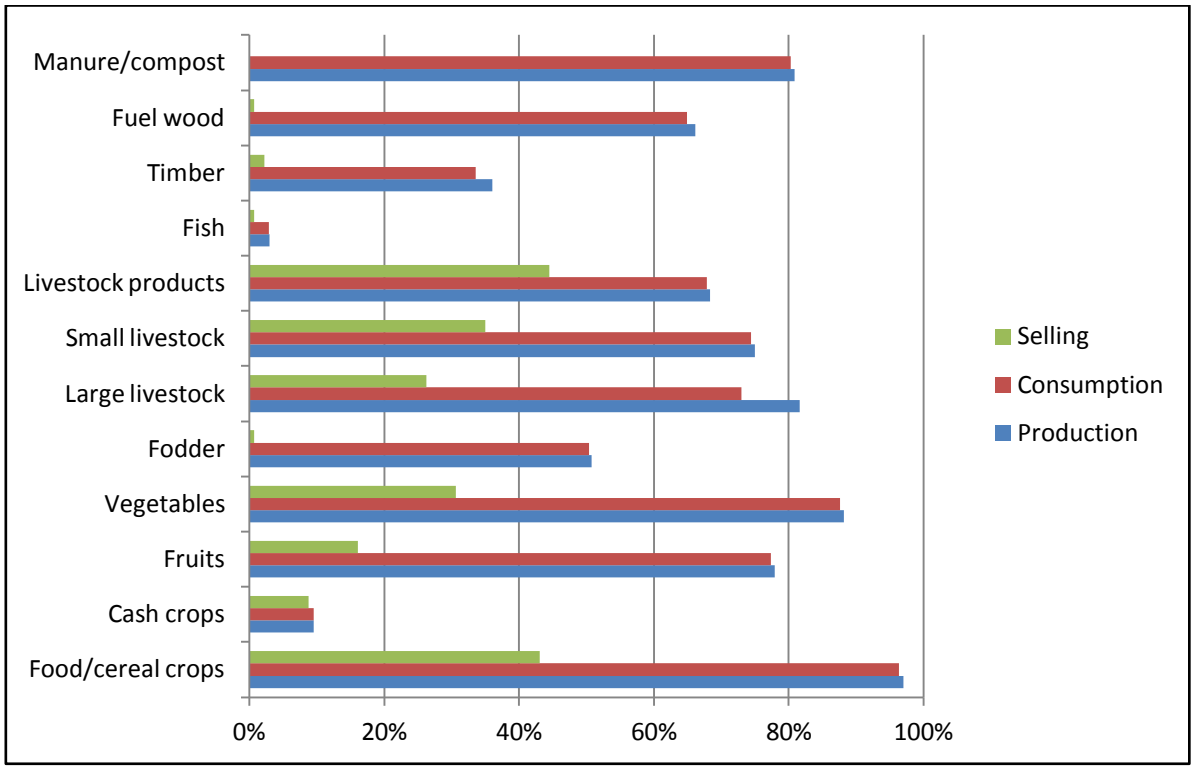
With respect to the diversity in consumption of different products, 96% of households consume some of the food crops they produce on their own farms whereas only 88% of households consume vegetables produced on their own farm. Livestock products are also important in their diets because 68% of households are reported to consume livestock products they produced and 75% of households consumed chickens and goats they raised.

When asked about sales of products produced on-farm, 43% of households are found to sell cereal crops they produced. Only 31% of households sold the vegetables like potato, cauliflower, tomato, etc. from their own farm. A nominal number of surveyed households cited selling fodder, timber and fuel wood from their own farms. Vegetables were also found to be sold by 31% of households. Fruit and cash crops are only sold by 16% and 9% of households respectively. Manure is not reported to be sold in the surveyed block. Seventeen percent of households did not sell any products listed in the table.

Table 2.1: Number of households producing, consuming and selling various agricultural products from their own farm

Product	Percent of households producing	Percent of households consuming	Percent of households selling
Food/cereal crops	97	96	43
Cash crops	10	10	9
Fruits	78	77	16
Vegetables	88	88	31
Fodder	51	50	1
Large livestock	82	73	26
Small livestock	75	75	35
Livestock products	68	68	45
Fish	3	3	1
Timber	36	34	2
Fuel wood	66	65	1
Manure/compost	81	80	0

Figure 3.1: Own farm diversity in products produced, consumed and sold



3.2 Off-Farm Livelihood Sources

Table 3.2 shows that 33% of households obtain and consume some food crops from off-farm sources. Fruits and fish are important sources of food received from off-farm sources. All households surveyed (100%) are found to be consuming fruits and 92% consumed fish as off farm products. Fifteen percent of households reported using timber and 28% of households collect fuel wood as off farm products. Notably, 99% of households reported selling fruit collected off-farm and 91% of households reported selling fish from off-farm sources.

Table 3.2: Agricultural products coming from off-farm sources/areas and consumed by households

Product coming from off-farm sources	Percent of households consuming	Percent of households selling
Food crops	33	32
Fruits	100	99
Fodder	10	10
Fish	92	91
Timber	15	15
Fuel wood	29	28
Honey	2	1
Manure/compost	6	6

3.3 Diversification Indices

A production diversification index was created by adding up the total number of agricultural products produced on-farm:

1 = 1-4 products (low production diversification)
2 = 5-8 products (intermediate production diversification)
3 = more than 8 products (high production diversification)

On the selling/commercialization side, the total numbers of agricultural products produced on their own farms, with some of the products sold were added up:

0 = no products sold (no commercialization)
1 = 1-2 products sold (low commercialization)
2 = 3-5 products sold (intermediate commercialization)
3 = more than 5 products sold (high commercialization)

The results of these diversification indices for our surveyed households in Rupandehi are shown in Table 3.3. More than half of the households surveyed have a high production diversification index, while 40% of households are categorized in the intermediate level. With respect to commercialization, only a small number of households (10%) have a high commercialization index, while 17% show no evidence of commercialisation, selling none of their agricultural produce.

Table 3.3 Production and commercialization diversification indices

Production Diversification:	**% of households**
1-4 products (low production diversification)	7
5-8 products (intermediate production diversification)	40
9 or more products (high production diversification)	53
Selling/Commercialization Diversification:	
No products sold (no commercialization)	17
1-2 products sold (low commercialization)	46
3-5 products sold (intermediate commercialization)	27
6 or more products sold (high commercialization)	10

3.4 Who Does Most of the Work for On- and Off-Farm Products?

Figure 3.2 below shows that most of the agricultural-related on-farm work in the surveyed area is shared by several household members. Women have greater responsibilities with respect to taking care of the livestock products, gathering fuel wood and doing households chores.

Figure 3.3 shows who is responsible for agricultural work off-farm. A total of 65% of respondents reported that most of the work is done collectively by several members of the family. It is reported that 24% of the off-farm work is done exclusively by men.

Figure 3.2: Agricultural workload on-farm by gender/sex

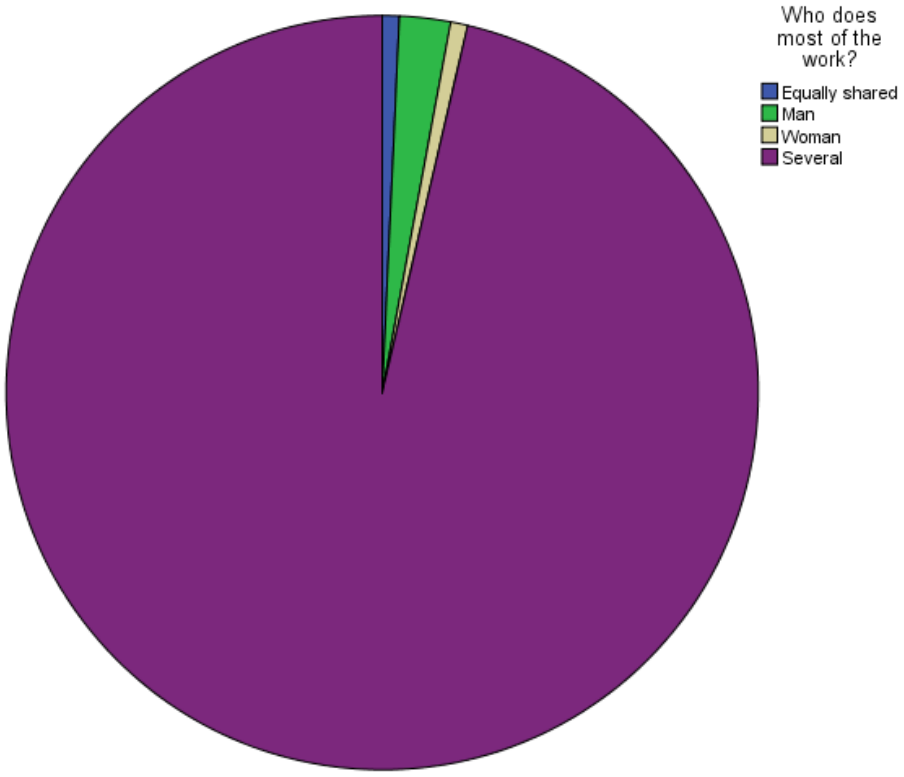
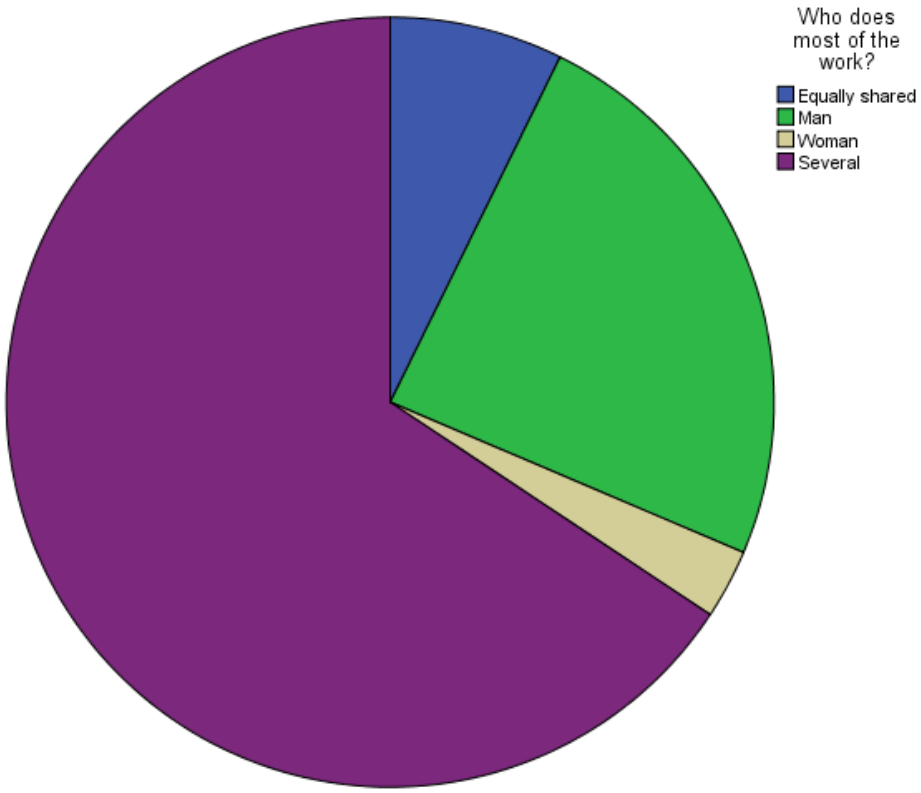


Figure 3.3 Agricultural workload off-farm by gender/sex



3.5 Sources of Cash Income

Among the surveyed respondents, 18% of households did not have any source of cash income. Most households (61%) reported having one or two sources of income. Table 3.4 shows the diversity of cash income sources from off-farm activities. Off-farm employment, employment on other peoples' farms, remittances and renting out farm machinery are the most important sources of cash income other than from their own farm products. A total of 26% of households reported that they received cash through employment on someone else's farm, 44% from other off-farm employment, 11% from business, 27% from remittances, and 12% from government or projects. Only 7% of households received cash from an informal loan or credit and 14% from a loan or credit from formal institutions.

Table 3.4: Sources of cash income other than from own farm

Source of Cash Income	Percent of households
Employment on someone else's farm	26
Other off-farm employment	44
Business	11
Remittances/gifts	27
Payments from govt or other projects/programs	12
Loan or credit from a formal institution	14
Informal loan or credit	7
Renting out farm machinery	18
Renting out your own land	7
No off-farm cash source	18

3.6 Discussion

The results show that most households in Rupandehi have a high production diversification. They produce many crops on their own farms, and many households also consume fruits and fish from off-farm sources. The rice-wheat cropping pattern predominates in this area and integration of livestock with crops is a general tendency of the farmers. In general, farmers grow few tropical fruit species in the homestead and they often purchase fruits like mangoes, litchi, pineapple, apple etc. from the markets. Fisheries are not common in this area and the majority of the farm households buy fish from the market or from those who own fish ponds. Agricultural work on their own farms is shared by multiple members of the households, while men are more responsible for off-farm work. There are varied sources of income within the site, although almost one fifth of households do not have an off-farm source of cash.

4.0 Crop, Farm Animals/Fish, Tree and Soil, Land Water Management Changes

4.1 Crop-Related Changes

When asked about the three crops most important crops cultivated, most of the respondents mentioned rice, wheat and mustard. They were then asked about what changes they had made to their farming system/practices over the last ten years and for which crops they made changes. Looking at the proportion of households who have made changes to one or more of their most important crops, we found that all households have made at least one change to at least one of their main crops. The results below (Table 4.1) show that most households made changes in up to three crops. Almost all of them (98%) reported that they had two to three crops in existence and one crop is different from the crop of ten years ago.

Table 4.1: Change in crops in last 10 years

Crops changes	Percent of households
Only one crop listed and is different from 10 years ago	1
2-3 crops listed and at most 1 is different from 10 years ago	98
2-3 crops listed and 2 or 3 are different from 10 years ago	1

Adopters of new crops/varieties

With respect to the number of households which had introduced new crops or new varieties in the last 10 years, we found that 10% of households had not introduced any new crops or varieties, 51% had introduced one or two new crops or varieties, and 39% of households had incorporated three or more new crops or varieties into their farming systems over the last 10 years (Table 4.2).

Table 4.2: Adoption of new crops/varieties over the last 10 years:

Change in Practice	Percent of households
No introduction of new crops or varieties	10
Have introduced 1 or 2 new crops and/or new varieties	51
Have introduced 3 or more new crops and/or varieties	39

Cropping related changes

With respect to cropping-related changes, we examined whether households had made one or more of the following changes over the last 10 years:

- Introduced intercropping
- Earlier land preparation
- Earlier planting
- Later planting

- Expanded area
- Reduced area
- Started using pesticides/herbicides
- Integrated pest management
- Integrated crop management

The results show that 59% of households had made 3 or more of these cropping related changes in the last decade.

Water management related changes

For the water management-related changes, the following changes in practice were considered:

- Started irrigating
- Introduced micro-catchments
- Introduced improved irrigation
- Introduced improved drainage

The results show that 97% of households had not made any of these water management-related changes.

Soil management related changes

For the soil management related changes, we considered the following behavioural changes:

- Stopped burning
- Introduced crop cover
- Introduced ridges or bunds
- Introduced mulching
- Introduced terraces
- Introduced stone lines
- Introduced contour ploughing
- Introduced rotations
- Started using or using more mineral/chemical fertiliser
- Started using manure/compost

It was reported that 58% of households have introduced one soil management related practice in Rupandehi district of Nepal and 38% of households cited having made two or more soil management related changes in the last 10 years. Only 4% of households had not made any soil management changes.

Tree/agroforestry management related changes

The results show that 76% of households have made no changes on agro forestry management in the last decade. Only 24% of households have made some tree/agro forestry related changes.

4.2 Reasons for Crop-Related Changes

The respondents were asked about the reasons for the specified crop related changes. The results show that 99% of households have made changes to their farming practices due to market reasons,

while 29% and 35% of households cited that they made crop related changes due to land and labour concerns, respectively. Changes due to projects are very nominal (less than 1% of households). The important drivers of change for 17% of households were pest and disease incidence as well (Table 4.3).

Table 4.3: Reasons for changing cropping practices, by category

Reason for changing cropping practices, related to:	Percent of households citing
Markets	99
Weather/climate	2
Land	29
Labour	35
Pests/diseases	17
Projects	1

Climate-related reasons

Only 2 households cited climate-related reasons for changes in farming practices. One household cited "more overall rainfall" as the reason, and the other household listed "less overall rainfall."

4.3 Livestock-Related Changes

The results of the household level baseline study show that 8% of households do not have any livestock and a further 18% of households have only one type of animal. Twenty-eight percent of households have two types and 47% of households have reported owning three types of animals.

When the respondents were asked about the changes over the last decade, we see that the majority of households (67%) have two or three animal types and at most one animal is different than ten years ago. A total of 7% of the households have two to three animal types and two to three are different from the animals reared ten years ago. The types of animal changed were buffalo, cow, goats and chicken (Table 4.5).

Table 4.5: Change in animal types in last 10 years

Animal type changes	Percent of households
No animals listed currently and/or 10 years ago	8
Only one animal type listed and is the same as 10 years ago	12
Only one animal type listed and is different from 10 years ago	6
2-3 animal types listed and at most 1 is different from 10 years ago	67
2-3 animal types listed and 2 or 3 are different from 10 years ago	7

Herd related changes

For herd related changes the following indicators were considered:

- Reduction in herd size

- Increase in herd size
- Change in herd composition

A total of 62% of households have made no herd-related changes and 38% of them made one or two changes over the past 10 years.

Animal management related changes

For animal management related changes we consider the following changes:

- Stall keeping introduced
- Fencing introduced
- Cut and carry introduced

A total of 71% of households did not make any animal management related changes in the past decade, 5% of households made one animal management related change, and 24% have made two or more animal management related changes.

Feed related changes

For feed related changes we consider the following:

- Growing fodder crops
- Improved pastures
- Fodder storage

A total of 96% of the surveyed households have made no feed-related changes in the last 10 years.

Reasons for changes to livestock rearing practices

Table 4.6 shows that 55% of households mentioned market-related reasons in relation to changes they had made in their livestock production systems. Another 52% of households cited labour related reasons in regard of livestock production and 16% of households cited pests and diseases related reasons for changing livestock practices.

Table 4.6: Reasons for changing livestock practices, by category

Reason for changing livestock practices	Percent of households citing
Markets	55
Weather/climate	9
Labour	52
Pests/diseases	16

For those who cited market-related reasons for changes in livestock practices, 82%, 90% and 94% of households stated that the change was made due to better price, new opportunity to sell and more productivity, respectively.

4.4 Adaptability/Innovation Index

An adaptability/innovation index was defined as the following:

0 = zero or one change made in farming practices over last 10 years (low level)
1 = 2 – 10 changes made in farming practices (intermediate level)
2 = 11 or more changes made in farming practices (high level)

We see in Table 4.5 that 2% of households made zero or only one change in what and how they farm over the last 10 years, 50% of households made between 2 and 10 changes, and 48% made 11 or more changes.

Table 4.5 Adaptability/Innovation index

Number of changes made in farming practices in last 10 years:	% of households citing
Zero or One (low)	2
2-10 changes (intermediate)	50
11 or more changes (high)	48

4.5 Mitigation Indices

Several climate mitigation-related behavioural changes were used to create the following indices:

Tree management
This index shows whether a household has either protected or planted trees within the last one year.

Soil amendments
This index shows if the household has used fertilizer in the last year, or has started using fertilizer or manure on at least one crop.

Input intensification
There are 7 'changes in agricultural practices/behaviour over the last 10 years' considered here to create an index with 3 levels - no intensification (none of the following), low intensification (1-3 of the following), and high intensification (4-7 of the following). They are:

- Purchased fertilizer
- Started to irrigate
- Started using manure/compost
- Started using mineral/chemical fertilizers
- Started using pesticides/herbicides
- Started using integrated pest management techniques
- Planted higher yielding varieties

Productivity Index
This index shows if a household has reported achieving a better yield from any crop, or that their land is more productive for any crop over the last 10 years – such households are classified as showing an "increase in productivity".

Table 4.6 shows the results for the mitigation-related indices for the surveyed households in Rupandehi. Nearly three-quarters of households reported some tree management activities over the last year, and all households undertook soil amendment (e.g. fertilization) actions. Most

households (92%) have experienced increases in agricultural productivity. Eighty-three percent of respondents have intensified their input use at a low level, and 18% at a higher level.

Table 4.6 Mitigation-related indices

Index	No (% of hh's)	Yes (% of hh's)
Tree management	29	72
Soil amendments	0	100
Increase in productivity	8	92
Input intensification	0	Low-83 High-18

4.6 Discussion

Many of the surveyed households in Rupandehi reported adopting new crops or varieties in the last 10 years and making cropping and soil related changes. Varietal changes could be observed mainly in rice and wheat, two very important crops for almost all farmers in this area. Since the National Wheat Research Program (NWRP) of the Nepal Agriculture Research Council (NARC) is located in this district, spread of new technologies including varieties is relatively quicker. Similarly, there are several NGOs working in the district particularly in the area of commercial vegetable production, social mobilization, farmers' field schools etc. and farmers seems to have adopted many technologies in farming as a result. Few households, however, reported making tree or water management related changes to their practices. Changes in regards to livestock keeping practices were not widespread. Most households fall within the intermediate and high categories of the adaptability/innovation index.

5.0 Food Security

The respondents were asked about the monthly source of food for the household, i.e. whether it came mainly from their own farm or elsewhere. The households were also asked during which months of the year they suffer from food insufficiency.

The data show that three quarters of surveyed households get food all months from on-farm sources. Twenty percent of households have food sufficiency for seven to eleven months of the year from on-farm sources and 6% have food sufficiency for less than seven months from their own farm. June through October are the months in which less food is available from on-farm sources. Figures 5.1 and 5.2 (next page) indicate the main source of food throughout the year and the months when households experience food shortages.

5.1 Food Security Index

The food security index we created is based upon the number of months that the household has difficulty getting food from any source (i.e. from their own farm or off-farm, from stores, gifts, purchases or transfers).

As reported by the respondents, only 3% of households have more than six food insufficient months in a year and 75% of households have food sufficiency all year round (Table 5.1).

Table 5.1: Food Security Index

Percent of surveyed households reporting:				
More than 6 hunger months/year	5-6 hunger months/	3-4 hunger months/	1-2 hunger months/	Food all year round/No hungry period
3	3	12	7	75

5.2 Discussion

Many households in Rupandehi are food secure throughout the entire year. On-farm production provides the majority of the diet. Some households need to procure food from off-farm sources, particularly during the months of July, August and September. Generally, farmers relate their food sufficiency with adequate production of rice and wheat, rice being harvested in October-November and wheat in March-April. Therefore, farmers have adequate on-farm production of rice and wheat from October to June. Farmers with small land sizes suffer food insufficiency for a few months. The area possesses highly productive soils for rice and wheat and it is considered a production bowl for Nepal, supplying large amounts of rice and wheat to the neighbouring districts.

Figure 5.11: Main source of food for the household

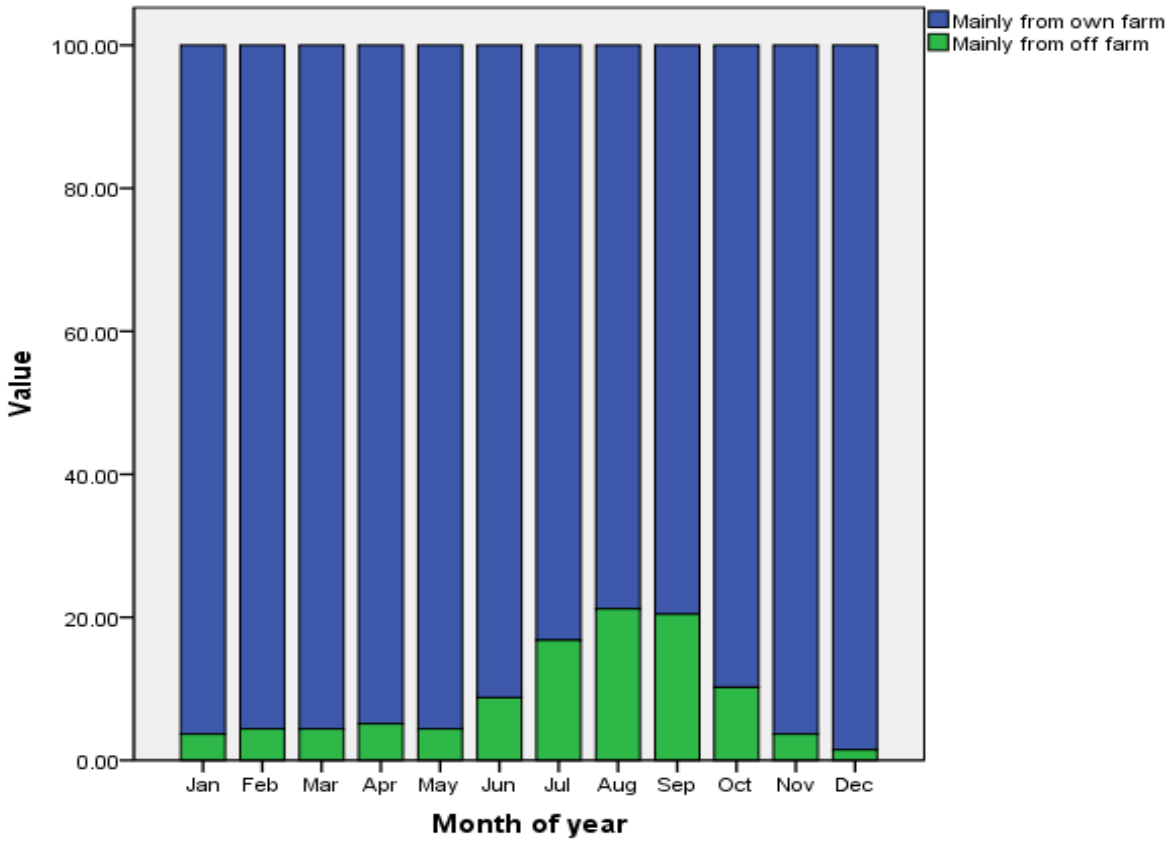
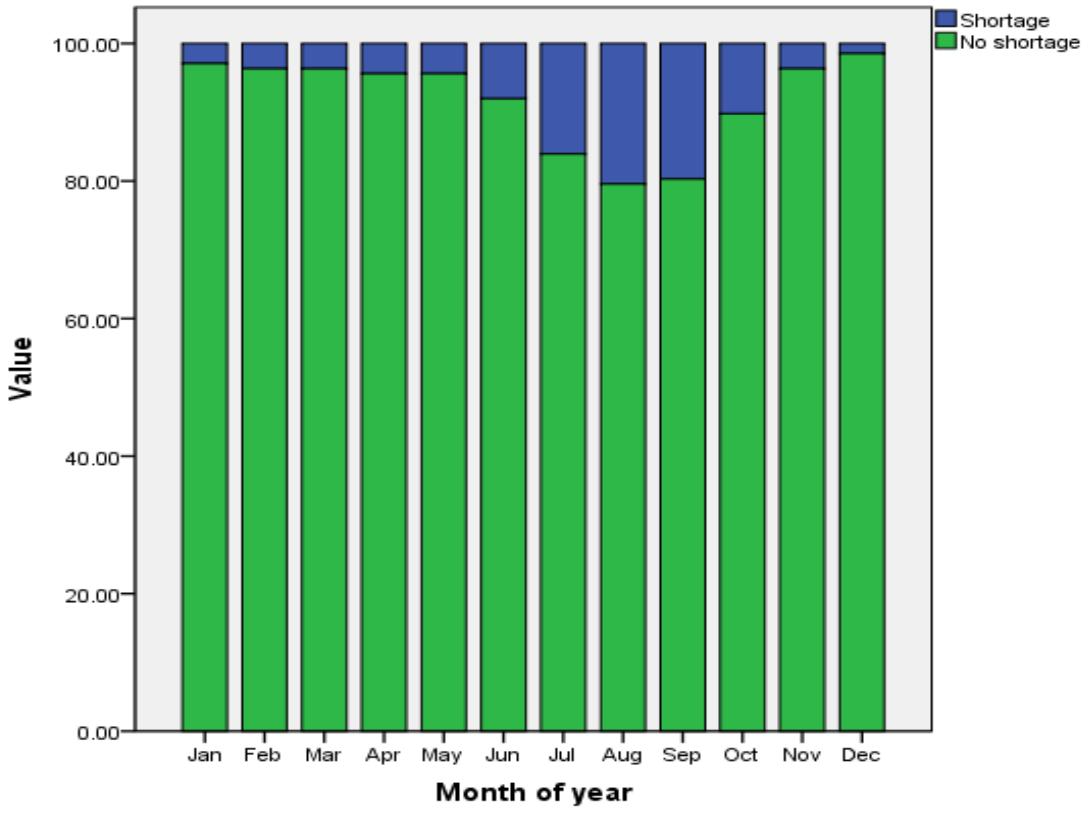


Figure 5.2: Food shortage months



6.0 Land and Water

6.1 Water for Agriculture

For the on-farm water sources (used for agricultural purposes, not for household use), Table 6.1 shows the percentage of households using each water source. It shows that 72% of households have irrigation as an on-farm water source and 35% have boreholes. Only 7% of households have none of these agricultural water sources on their own farms.

Table 6.1: Water sources for agriculture on-farm

On-farm agricultural water source	% of households
Irrigation	72
Tanks for water harvesting	2
Dams or waterholes	2
Boreholes	35
Water pumps	29
None of the above	7

6.2 Land Use

The land available for each household includes both land that is owned by the household and land that is rented. Table 6.2 shows that 50% of households have less than one hectare of land, and 43% of the surveyed households reported that they have access to one to five hectares of land. Only 4% of households have more than five hectares of land, and 3% of households do not own any land.

Table 6.2: Total land size accessed by households

Number of hectares of land owned and rented	Percent of households
No land	3
Less than one hectare	50
1-5 hectares	43
Over 5 hectares	4

Hired machinery or labour

Respondents were asked whether they sometimes hire an animal drawn plough, a tractor, or farm labour. The results show that 14% of households hire an animal drawn plough for the preparation of land. Eighty-three percent of households in the surveyed block reported hiring a tractor, and 85% sometimes hire farm labour. Only 2% of households do not hire machinery or labour in the survey site.

6.3 Discussion

Almost 50% of the surveyed households were marginal farmers (<1 ha) followed by smallholders (1-2 ha) and medium holder farmers (2-5 ha). However the relatively high levels of diversification and food security indicate that farmers are making productive use of the land they do have. With the availability of high yielding varieties of rice and wheat and consequent mechanization in production systems, the use of tractors and associated implements for land preparation is common in this area.

7.0 Inputs and Credit

Table 7.1 shows 61% of surveyed households bought seed, 100% purchased fertilizer, 87% purchased pesticides and 71% bought veterinary medicines in the last 12 months. Only 4% of households received credit for agricultural activities.

Table 7.1: Purchased Input use

In the last year, did you use:	Percentage
Purchased seeds	61
Purchased fertilizers	100
Purchased pesticides	87
Purchased veterinary medicine	71
Credit for agricultural activities	4

7.1 Fertilizer Use

Table 7.2 shows the types of fertilizer households use in their farms. The results show that 100% of households applied urea in their crops. Similarly, 94% of households used DAP, 85% of households used a local mixture and 51% of households use several types of fertilizers.

Table 7.2: Type of fertilizer

Fertilizer type	Percent of households
Urea	100
DAP	94
Local mixture	85
Several types	51

People in the surveyed block use up to five types of fertilizers to increase productivity (Table 7.3). All but one household applied fertilizer to rice, and a similar number (132 out of 137) applied it to wheat. Just over half of households (54%) applied fertilizer to mustard and just under half (47%) applied it to potatoes.

Table 7.3: Number of fertilizers used by households

Types of fertilizers used	Percent of households
One type	5
Two types	4
Three types	41
Four types	46
Five types	4

7.2 Discussion

Use of agricultural inputs is very high in Rupandehi. Because many households have access to irrigation, they are willing to invest in fertilizers for their crops, as opposed to farmers reliant on rainfed cropping who often do not purchase inputs if there is a risk that rainfall will fail. Since this

district is located near the Indian border, farmers generally obtain fertilizer from the Indian market whenever there is a short supply of key fertilizers in Nepalese markets. Therefore, input use in this area is not a key issue. Application of pesticides is highly common among commercial vegetable growers. Almost all farmers apply unbalanced doses of fertilizers in their crops. Households also place great value on their livestock and purchase veterinary medicines when necessary.

8.0 Climate & Weather Information

The survey respondents were asked what types of weather-related information is received by members of the household. We inquired if the households received information on extreme events, pest or disease outbreaks, start of the rains, weather for the next 2-3 months, and weather for the next 2-3 days. Results show that 71% of households receive information about weather for the next 2-3 days but not about any of the other topics.

8.1 Who is Receiving Information?

Of the households that receive weather-related information, 77% report that both men and women receive the information. Twenty-two percent report that only men receive the information, while just 1% reports that only women receive the information.

8.2 Types of Weather-related Information

The major sources of weather related information in the surveyed households were radio and television. The results show that 93% of households receive information from radio and 77% of households from television. They did not report any other sources of information like NGOs, friends/relatives, or newspapers. Seven percent of the households receiving a weather forecast for the next 2-3 days reported that the forecast included agricultural advice, but none of the households were able to use that advice.

8.3 Discussion

Weather forecast information received by the farmers in this area is generic and often not precise. Although many farmers still pursue such information, they are very reluctant to believe such information. Since a large proportion of the farmers possess TV and radio, they are the common source of harnessing weather forecasts. Forecasts related to adverse events such as disease/pest outbreak is not common in Nepal.

9.0 Community Groups

Group membership, especially membership in saving and credit cooperatives, generally appears to be at a high level in the surveyed area. Vegetable production and agricultural products marketing group membership, however, is quite low in this area. Among the surveyed households, 85% have someone who is a member of a saving and credit groups or institutions. Only 11% are not involved in any community groups (Table 9.1). The results also show that 82% of households are attached to a single group and few households to more than one group.

Table 9.1: Group membership

Does someone in your household belong to the following groups?	Percent of households
Tree nursery/tree planting	1
Irrigation	2
Savings/credit related	85
Agricultural product marketing	2
Seed production	1
Vegetable production	6
Other group not mentioned above?	2
Not a member of any groups	11

9.1 Climate Related Crises

The households were asked whether they have faced a climate related crisis in the last 5 years and whether or not they received help. The survey team also inquired about the source of help if they received assistance.

The results show that 91% of the surveyed households did not face a climate-related crisis in the last five years. Only 9% of them (12 households) cited that they had faced such an event. The households in the block were also asked if they received any assistance. Of the households that had faced a climate-related crisis, 11 households reported that they did not receive assistance of any kind whereas 1 household reported that it had received help.

9.2 Discussion

Farm households in this area are very active members of the groups. These groups take several forms such as NGO-formulated producers' groups, cooperatives, saving-credit groups, etc. Members of the saving-credit groups, which are very popular in many villages, regularly save some money and they provide micro-credit to the needy farmers with very nominal interest rates. Climate related crises have not begun to affect many residents of the Rupandehi site as evidenced by results of the household survey.

10.0 Assets

10.1 Asset Indicator

Households were asked about what assets they had, from a set list. The assets they were asked about include the following:

Energy: generator (electric or diesel), solar panel, biogas digester, battery (large, e.g. car battery for power)
Information: radio, television, cell phone, internet access, computer
Production means: tractor, mechanical plough, thresher, mill
Transport: bicycle, motorbike, car or truck
Luxury items: refrigerator, air conditioning, fan, bank account, improved stove
Structures/utilities: improved storage for crops, water storage tank, running/tap water, electricity from a grid, improved housing/roofing, separate housing for livestock

The total number of assets in all categories was added up and the following asset indicator created:

0 = no assets (basic level)
1 = 1 – 3 assets (intermediate level)
2 = 4 or more assets (high level)

It is important to note that this indicator is not intended to include every possible type of asset, and that the checklist includes some indicators that we expect to see becoming more important in the future than they may be at present. It also does not include a critical asset for resource-poor households – livestock assets.

Table 10.1: Asset Index

Number of queried assets	% of households
None (basic level)	0
1-3 (intermediate level)	22
4 or more (high level)	78

As shown in table 10.2, the results of the survey analysis in Rupandehi reveal that 96% of households have a bicycle, 14% have a motorbike and 2% have a car/truck as transport assets. In regard to energy assets, 84% of households do not own any of the energy assets queried by the survey, but 13% have liquid pressurized gas, 4% have a biogas digester, and 2% of households have generators.

Within the information asset category, 77% of households own a radio, 68% have a television and 1% has internet facility. Eighty-six percent of households have cell phones, and only 6% of households do not own any of the information assets listed.

Regarding luxury assets, 5% of households have a refrigerator, 80% of households have an electric fan, and 54% have a bank account. Eighteen percent of households do not own an asset from the luxury category.

Assets within the production category include tractor, mechanical plough, water pump/treadle pump, thresher and fishing nets. The data show that 16% of households have a tractor, 57% have a

mechanical plough, 30% have a treadle pump and 31% have fishing nets. One third of households do not own an asset in the production category.

When asked about structures and utilities within the household, 78% of respondents reported having improved housing (such as concrete, bricks, etc.). Eighty-five percent of surveyed households have a well or borehole for domestic water use, and 88% receive electricity from a grid.

Table 10.2: Asset ownership

Asset type	Percent of households
Radio	77
Television	68
Cell Phone	86
Internet	1
Refrigerator	5
Electric fan	80
Bank account	54
Bicycle	96
Motorcycle	14
Car/truck	2
Tractor	16
Mechanical plough	57
Treadle pump	30
Thresher	12
Fishing nets	31
Motor/generator	2
Battery	1
Bio gas	4
LPG	13
Improved housing	78
Well/borehole	85
Electricity from a grid	88

10.2 Discussion

This asset indicator suggests that many households have radios, bicycles, electric fans, mechanical ploughs, etc. In connection to energy assets, however, many households (84%) do not have these assets. A majority of households do, however, receive electricity from a grid. More than three quarters of the surveyed households fall in the high level of asset ownership. Radio, TV, bicycle and cell phones are very common assets in this area.

Appendix 1: Survey Process and Team Members

Five Terai districts of Nepal (Sunsari, Sarlahai, Rupandehi, Banke and Kanchanpur) were selected for HH level baseline surveys. The districts were selected considering the gradient of climatic variability from east to west of the Indo-Gangetic Plain (terai), and the proportionate distribution of geographical area having climate change impacts. In each district, a survey site of 10km x 10km block was located with the help of a GIS expert for surveys. The Rupandehi site was selected to be a 'core site' as a focus for CCAFS activities.

The survey team was composed of four enumerators and one supervisor who visited each selected HH and gathered information using the standard survey questionnaire agreed by the CCAFS survey group. This survey team was supervised by the team leader. The GPS location of each HH was noted using a GPS unit. Two data entry clerks entered data separately using CSPro statistical package. It was sent to ICRAF for analysis. The names of members involved in the data collection and data entry process are as follows:

1. Mr. Chiranjibi Adhikari- Team Leader
2. Mr. Ganesh Acharya- Supervisor
3. Mr. Bhola Pandey- Enumerator
4. Mr. Santosh Sharma- Enumerator
5. Mr. Nemm Lal Pandey- Enumerator
6. Ms. Laxmi Khadka- Enumerator
7. Ms. Prapti Adhikari- Data entry clerk
8. Ms. Reena Shrestha- Data entry clerk

In each block 7 villages/settlements were randomly selected. The sampling process was by three layers in a hierarchy: This may be explained as 10 x 10 km block (one per site), villages within a block (7) and households within each village (20). Twenty Households from each village were selected randomly.

After an area of 10x10 km (block) was selected with the help of a GIS expert in each district, the data collection started with pre consultation of VDC secretaries so that more information and ideas about the surveying areas were available. The names of all households were listed and lists of villages within each selected block were updated. Seven villages were randomly selected using a lottery process.

A complete list of households within each selected village was generated with the help of village authorities or key persons. A total of 20 Households were selected through a lottery process and interviewed using the CCAFS standardized questionnaire. Interviews with one or more individuals within the household (usually the household head and spouse) who are able to answer questions about their household were carried out.

Appendix 2: Sampling Frame – List of Villages

The names of the villages in the block were as follows:

Tikulighad, Supauli, Madhaulia, Hatibangai-2 Bauria Tole, Judha Bagdhurwa, Rehara Hatibangi–9, Prati Tole, Chilia-8 Madhuwantole, Parsohia, Kothihawa, Bohiya, Khunsa, Laxminagar, Padshari, Dumduwa, Harniya, Sitapur, Amuwa, Bashantapur- Madhuri Tole, Hatibangai-1 Bangai Tole, Sonaren, Dohagari, Shreerampur, Laxmonagar, Hati Bangai-6.

The names of villages that were the part of household baseline study in the Rupandehi block were as follows:

1. Chilia-8 Madhuwantole
2. Rehara, Rupandehi
3. Hati Bangai-6, Mauari Tole
4. Hatibangi – 9, Prati Tole
5. Hatibangai-2, Bauria Tole
6. Bashantapur, Madhuri Tole
7. Hatibangai-1, Bangai Tole