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CGIAR RESEARCH PROGRAM ON Climate Change, Agriculture and Food Security

CCAFS

Midline Household Survey Results
Rupandehi, Nepal

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Correct citation:
Bhusal A, Pudasaini R, Khatri L, Neupane S, Nagpal M, Khatri-Chhetri A. 2020. Midline Household Survey Results: Rupandehi, Nepal. CCAFS Report. Wageningen, the Netherlands: CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS). Available online at: www.ccafs.cgiar.org

Published by the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS).

The CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS) is a strategic partnership of CGIAR and Future Earth, led by the International Center for Tropical Agriculture (CIAT). The Program is carried out with funding by CGIAR Fund Donors, Australia (ACIAR), Ireland (Irish Aid), Netherlands (Ministry of Foreign Affairs), New Zealand Ministry of Foreign Affairs & Trade; Switzerland (SDC); Thailand; The UK Government (UK Aid); USA (USAID); The European Union (EU); and with technical support from The International Fund for Agricultural Development (IFAD).

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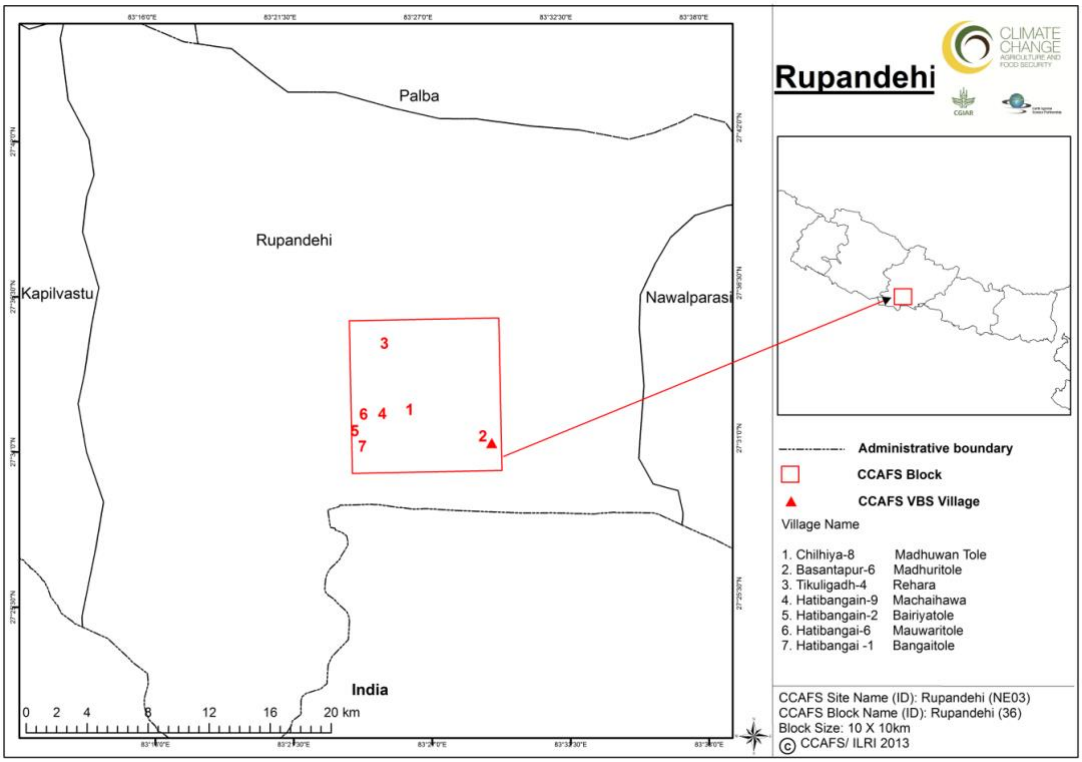
1. Introduction

This report presents the results of the CCAFS household midline survey, which was carried out during April-May 2019. The survey revisited the original 135 households sampled in the CCAFS baseline survey in seven villages of Nepal's Rupandehi district (Figure 1). The objective is to capture different kinds of information to understand better the diversity in the landscape across communities and households and see how these have changed since the baseline was conducted. The household survey was conducted using the Open Data Kit (ODK) tool and the standardized questionnaire developed by the CCAFS team. The survey process and implementing team are described briefly in Appendix 1.

Figure 1. Map of study site at Rupandehi district



The midline household survey collected information at the household level. Through the survey, information was collected on topics including sources of livelihoods, different agriculture/natural resource management strategies, need and use of climate and agriculture-related information and current risk management, along with

mitigation and adaptation practices. These households were revisited 7 years after the baseline study to monitor changes in the households. The main objectives of the study were to:

- Assess changes in assets related to climate change adaptation and mitigation strategies;
- Understand the different practices and technologies being implemented for climate change action;
- Assess changes in agricultural and livestock practices;
- Assess diversification in livelihoods, sources of income and food security; and
- Assess changes in soil and water management practices and uptake of new practices.

The questionnaire was organized into the following sections:

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

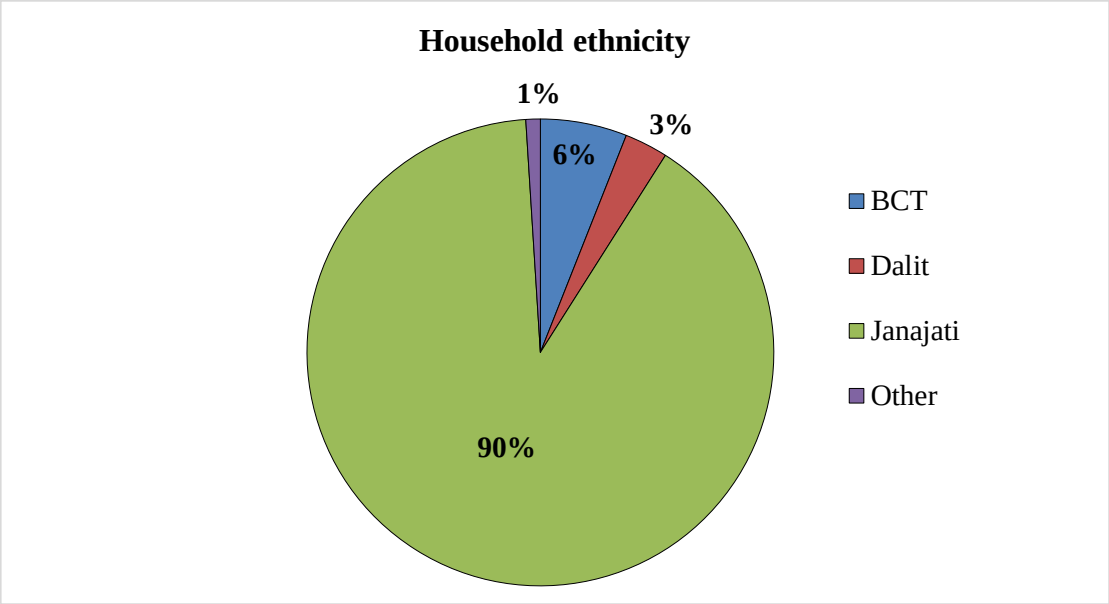
1.1. Household types and respondents

Only 34% of the total respondents surveyed were women with the remaining 66% being men. This gender imbalance can be explained by the fact that women respondents are more hesitant to talk and answer the questions resulting in a higher number of men respondents. Women were mostly engaged in taking care of the

household chores while men owned businesses and other official works. Women were also the ones predominantly involved in farming and agricultural activities.

Respondents from the surveyed households were mainly Janajati, comprising 90% of the total households visited. Brahmin, Chhetri and Thakuri (BCT) households were 6% whereas Dalit and other households represented 3% and 1% of the total households, respectively.

Figure 2. Household ethnicity



2. Household demographics

2.1. Education levels

The table below (Table 1) shows that out of the total households surveyed, in 50% of the households, the highest level of education achieved was secondary education or above. In 26% of the households, the highest level of education achieved was primary education. In 22% of the households, the highest level reached was post-secondary. Only 2% of households did not include a family member with formal education.

Table 1. Levels of education

Highest level of education achieved by any household member	% of households
No formal education	2
Primary	26
Secondary/High School	50
Post-Secondary	22
Total	100

3. Sources of livelihoods

3.1. On-farm livelihood sources

Table 2 shows the percentages of households producing different types of agricultural products on their own farm and the percentage of selling those products. 99% of the households produce food/cereal crops and 74% of the households produce vegetables. However, only 60% of households typically sell food crops and only 19% sell vegetables. Similarly, 48% of the households are producing fruits but only 16% of households sell fruits. Only 1% of the households are producing cash crops and 1% are selling it. These results indicate that cash crops are the least preferred crops by the community to cultivate.

Regarding the livestock sector, 61% of households are raising large livestock (cattle and buffaloes) with only 30% of households selling large livestock. Similarly, 60% of the households are raising small livestock like goat, pig and chicken, with 46% of households selling. The livestock products (milk and eggs) are produced by 16% of the households and sold by 11% of the households. Only 1% of the households surveyed produce fish on their own farm. Additionally, 12% of the households produce timber. Compost and manure are produced and used by 47% of households on their own farm.

Table 2. Percentage of households producing and selling on-farm agricultural products

Products	% of households producing on farm	% of households selling
Food/cereal crops	99	61
Vegetables	74	19
Large livestock	61	30
Small livestock	60	46
Fruits	48	16
Manure/compost	47	1
Fodder	28	1
Livestock products	16	11
Timber	12	1
Cash crops	1	1
Fish	1	1

3.2. Off-farm livelihood sources

Table 3 illustrates that 29% of the total households visited are consuming food crops obtained from off-farm sources. Similarly, 19% of households are consuming fruits, and 13% consuming fish from off-farm sources. Only 12% and 4% of the households use fodder and fuel wood from the off-farm sources. Moreover, 9 % of households use manure/compost from off-farm sources and 1% of households use timber from off-farm sources. A very small percentage of surveyed households were found to be selling food crops obtained from off-farm sources. These results in comparison to the findings on on-farm sources indicate that the majority of the households are likely to consume food and other goods produced directly from their own farms.

Table 3. Agricultural products coming from off-farm sources and consumed by households

Products (off-farm)	%of household consuming	% of household selling
Fish	13	0
Fodder	12	0
Food crops	29	1
Fruit	19	0
Fuelwood	4	0
Manure/compost	9	0
Timber	1	0

3.3. Diversification indices

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

1 = 1-4 product(s) (low production diversification)

2 = 5-8 products (intermediate production diversification)

3 => 8 products (high production diversification)

Table 4 presents the diversification indices of the surveyed households at midline. 48% of the total households visited have low production diversification while 46% of the households have intermediate production diversification. Only 6% of the total households were found to be having high production diversification on their farm.

Table 4. Production diversification index

Production diversification	Percentage of households
1-4 products (low production diversification)	48
5-8 products (intermediate production diversification)	46
9 or more products (high production diversification)	6

3.4. Who does most of the work for on- and off-farm products?

Results show that on-farm agricultural work is mostly done by women household members (54%) compared to men (38%) as shown in Figure 3. Greater involvement of women in farm activities implies that farming is done mostly by women. In contrast, 61% of men household members are involved in off-farm activities compared to women members that account for only 33% as depicted in Figure 4.

Figure 3. Agricultural on-farm workload by gender/sex

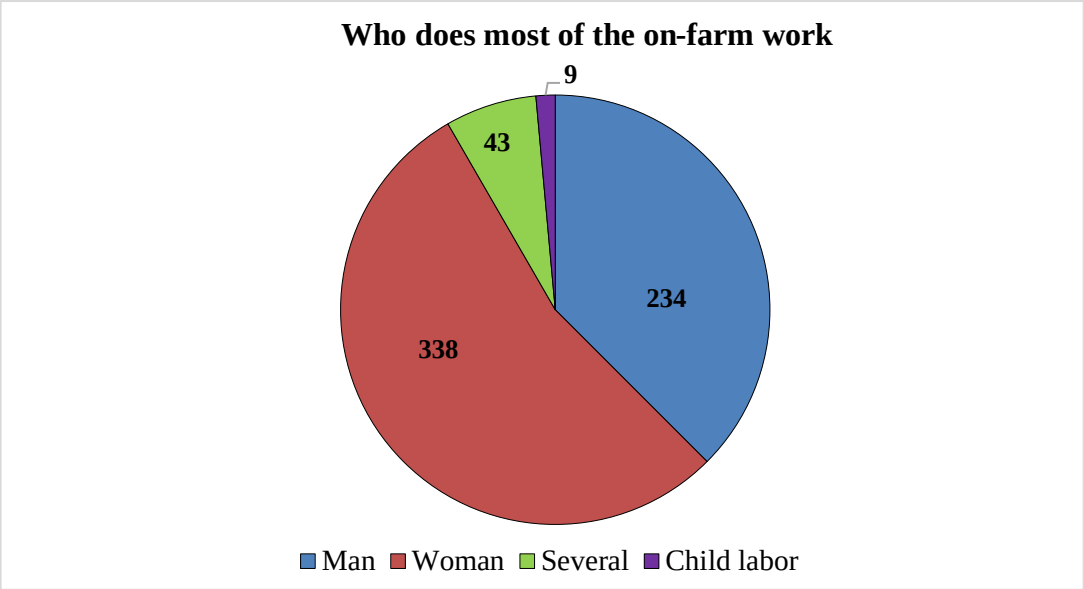
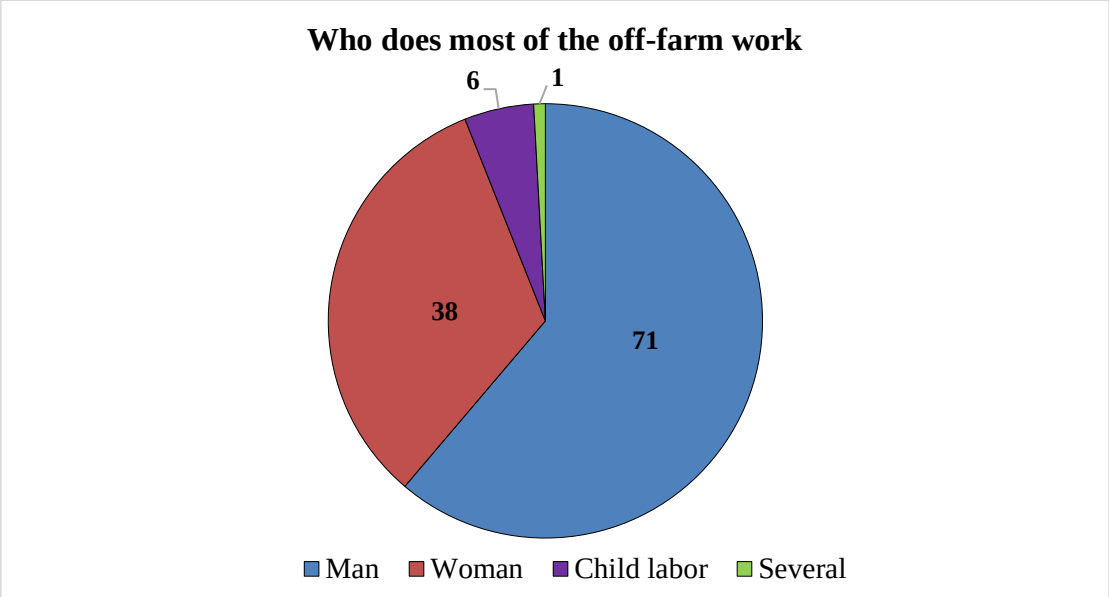


Figure 4. Agricultural off-farm workload by gender/sex



3.5. Sources of cash income

Table 5 shows that the majority of the surveyed households' cash income is generated through payments from the government or from other projects/programs (33%), remittances/gifts (29%) and business (25%). Only 3% of the households derive their

source of income from employment on someone else's farm. 6% of households receive loan/credit from a bank or other formal institutions (micro-finance, projects/programs, registered group) and 1% receive loans from informal source (relative or money lender). The renting out of farm machinery generated cash income in 9% of the surveyed households. Meanwhile, the renting out of one's own land resulted in cash income generation in 4% of the households. Finally, 20% of the surveyed households reported to have no off-farm source of income.

Table 5. Sources of cash income other than from own farm

Source of cash income	%of households
Employment on someone's else farm	3
Business	25
Remittances/gifts	29
Payments from government or other projects/programs	33
Loan or credit from a formal institution	6
Informal loan or credit	1
Renting out farm machinery	9
Renting out your own land	4
No off-farm cash source	20

3.6. Discussion

The results show that the majority of the households in Rupandehi district have a low to intermediate production diversification. The rice-wheat cropping pattern was predominant in the region. Fisheries and aquaculture were not common in the villages under study with the majority of the households buying fish from outside (markets). The workload of on-farm activities is taken on mostly by women while men are more involved in off-farm activities.

Comparison of the diversification index results from the midline and baseline surveys shows that the number of crops cultivated on farm has declined in the last seven years. While more than half of the surveyed households produced more than nine products on farm during the baseline survey period, this ratio has declined to six only at the time of the midline survey.

Moreover, the agriculture workload of on-farm activities has increased for women. During the baseline, it was reported that this workload was largely shared by several members of the household, which has now shifted towards women in the household. The occupation of men on off-farm activities has also risen in the midline survey. During the baseline, the workload was largely shared by several members of the household but is now reported as predominantly dominated by men. Sources of cash income have also changed over the survey periods. The proportion of households generating cash income from other off-farm employment has declined while the proportion of income coming from businesses or payments from the government or other projects/programs has increased more than two-fold. The proportion of households generating cash income from remittances has remained unchanged.

4. Crop, farm animals/fish, tree and soil, and land and water management changes

4.1. Crop-related changes

When asked about the three most important crops cultivated, the majority of the households mentioned rice, wheat and mustard.

4.1.1. Adoption of new crops/varieties

Table 6 presents the percentage of households that have adopted some or no new crop(s)/varieties. Results showed that 37% of the respondent households have adopted single new crop or variety. 76% of the respondents have adopted two new crops or varieties, while 26% of the respondents reported to having adopted three or more crops or varieties on their farm. Finally, only 4% of the households did not adopt any new crops or varieties.

Table 6. Change in crops

Crops changes	% of households
Single new crop or variety	37
Two new crops or varieties	76
Three or more crops or varieties	26
Not adopting any new crops or varieties	4

4.1.2. Crop-related changes

The majority (76%) of the households have cultivated higher-yielding varieties in the research site. 35% of households used better quality varieties and 19% of households have made changes by introducing new varieties of crops (Table 7).

Table 7. Proportion of households adopting new crops/varieties

Type of varietal adoption	Number of households	% of households
Introduced new variety of crops	25	19
Planting better quality variety	47	35
Planting disease-resistant variety	1	1
Planting drought tolerant variety	24	18
Planting flood tolerant variety	2	1
Planting higher-yielding variety	103	76
Planting longer cycle variety	2	1
Planting pre-treated/improved seed	1	1
Planting shorter cycle variety	13	10
Stopped using a variety	2	1

Water management related changes

Regarding the water management related changes, the following practices were considered:

- Started irrigation
- Stopped irrigating
- Water harvesting

The results point out that 96% of households did not make any of these water management-related changes in Rupandehi district.

Soil management related changes

For the soil management related changes, the following agricultural practices were considered:

- Earlier planting
- Minimum tillage
- Stopped burning

- Introduced intercropping
- Introduced rotations
- Expanded area
- Reduced area
- Started using or using more mineral/chemical fertilizer
- Started using or using more pesticides/herbicides
- Started using manure/compost

The results show that 21% of households have introduced at least one soil management related practice in Rupandehi district. 17% of the households surveyed reported practising two soil management related changes over the decade. 13% of households have introduced three soil management related practices and 4% of the households have adopted more than three soil management practices. On the other hand, 79% of households have not introduced any soil management related practices.

Tree/agroforestry management related changes

The findings suggest that none of the households have made any agroforestry management related changes since the baseline study. Similarly, all surveyed households have made no tree forestry related changes.

Reasons for changing cropping practices

There are many reasons behind the changes in cropping practices as shown in Table 8. Markets affected changes in 57% of the households. 26% of the households reported labour as a major factor for changes in livestock keeping practices. 13% of the surveyed households mentioned weather/climate as a reason for changes in cropping practices.

Table 8. Reason for changing cropping practices, by category

Reason for changing cropping practices	Percent of households
Markets	57
Weather/climate	13
Labour	26
Land	3
Pests/diseases	3
Projects	3
Others	1

4.2. Livestock-related changes

Results show that the most important animals changed between baseline and midline survey periods; these animals are oxen (traditional), goats, buffalos, oxen (traction) and dairy cows.

Table 9 illustrates the changes in animal types after the baseline study. 68% of the households mentioned only one animal type change since the baseline survey. Similarly, 27% of the households mentioned only two animal type changes. 2% of the households mentioned three or more animal changes in the last 7 years. Finally, 3% of the households listed no animal changes in the past 7 years.

Table 9. Change in animal types in the last 7 years

Animal type changes	% of households
Only one animal type listed	68
Only two animal type listed	27
Three or more animal type listed	2
No animals listed currently	3

Herd related changes

For herd related changes, the following indicators were considered:

- Reduction in herd size
- Increase in herd size
- Change in herd composition

The results show that 93% of the surveyed households have made no herd related changes while 7% of the households report having made some herd related changes.

Animal management related changes

For animal management related changes, the following indicators were considered:

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

All surveyed households have made no animal related changes in the past decade.

Feed related changes

For feed related changes we consider the following:

- Growing fodder crops
- Improved pastures
- Fodder storage

99% of the surveyed households have made no feed-related changes in the last 7 years.

Reasons for changing livestock practices

There are multiple reasons behind the changes in livestock keeping practices, as shown below in Table 10. 62% of the households reported labour as a major factor for changes in livestock keeping practices. Animal diseases and pest were cited as a reason for changes in husbandry practices by 25% of the total surveyed households. Market was also mentioned as an important factor by 24% of the households. Only 11% of the surveyed households mentioned weather/climate as a reason for changes in livestock keeping practices.

Table 10. Reasons for changing livestock practices, by category

Reason for changing livestock practices	Percentage of households
Weather/climate	11
Pest	25
Labour	62
Market	24

4.3. Adaptability/Innovation index

An adaptability/innovation index is defined as the following:

0 = zero or one change made in farming practices over the last 7 years (low level)

1 = 2-10 changes made in farming practices (intermediate level)

2 = 11 or more changes made in farming practices (high level)

Table 11 shows the changes made by farmers in farming practices since the baseline survey. Results indicate that 47 % of the surveyed households either changed zero or only one farming practice over the period of the last 7 years. Similarly, 53% of the

households changed 2 to 10 farming practices since the baseline study. No single household changed more than 10 of their farming practices since the baseline study.

Table 11. Number of changes made in farming practices in the last 7 years

Changes made in farming practices	Percentage of households
Zero or one change (low)	47
2-10 changes (intermediate)	53
11 or more changes (high)	0

4.4. Discussion

The midline report points out that the majority of the households in Rupandehi district have adopted new crop varieties to adapt to changing environmental conditions and to improve crop yields. It seems that many households have now adopted different varieties including high yielding, disease and pest resistant, drought resistant, and high-quality varieties. In contrast to the baseline results, many households reported only one animal type change. Moreover, 93% of the households reported no herd related changes during the midline survey against 62% of the households during the baseline survey. All surveyed households have made no animal related changes in the past 7 years while 71% of the households had made animal related changes at the time of the baseline. Labour was found to be the main reason given for changes in livestock keeping practices compared to the combination of market and labour explanations reported at the time of the baseline. Similar to the baseline results, all households have made no agroforestry management changes.

5. Food security

5.1. Food security index

The food security index (Table 12) was constructed using household data on yearly food availability from different sources, both from on-farm and off-farm sources. Only 1% of the respondents were found to be experiencing food shortages for more than six months in a year. 5% were facing food shortages for 5 to 6 months in a year. Moreover, 10% of the household were experiencing food shortages for 3 to 4 months

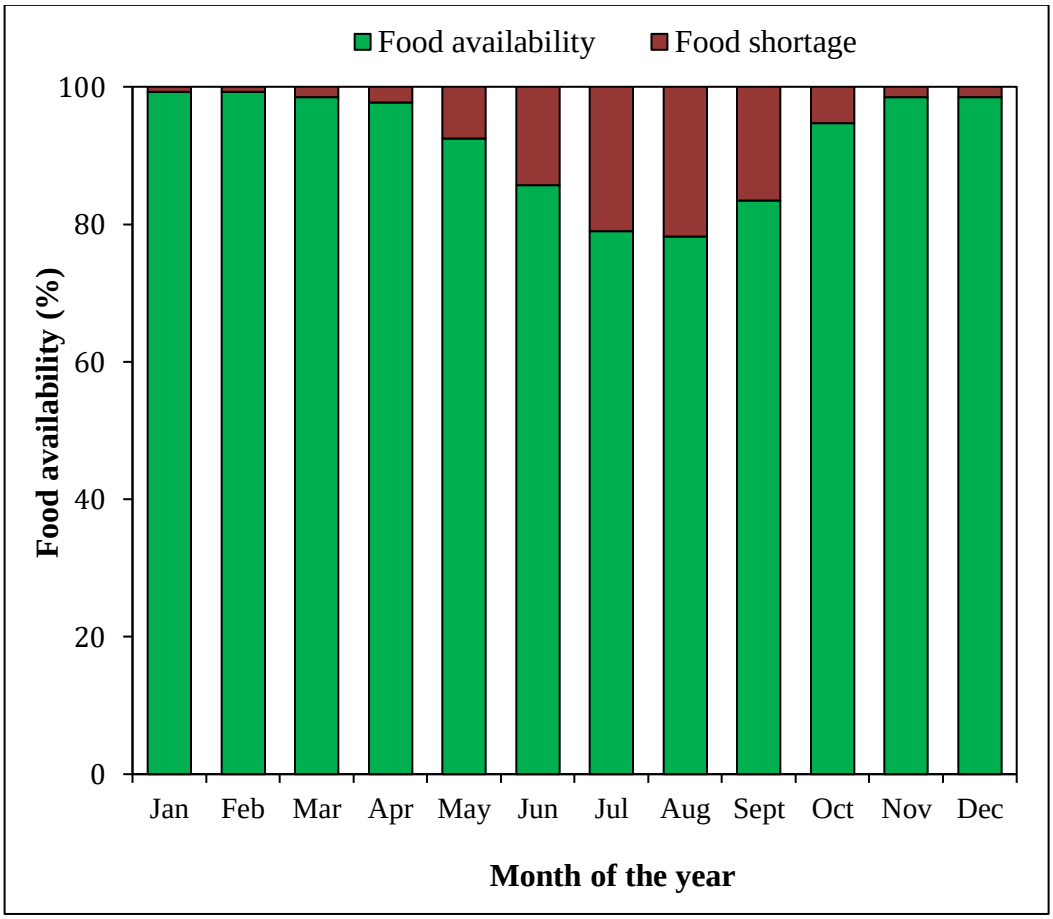
in a year while 5% were facing food shortages for 1 to 2 months in a year. 78% of the respondents reported not having faced any hunger/food shortages at all.

Table 12. Food security index

More than six months of hunger	5-6 months of hunger	3-4 months of hunger	1-2 months of hunger	Food all year round/ No hunger
1	5	10	5	78

The data collected on seasonal food availability (Figure 5) show that November to April seems to be the period with the highest food availability, whereas May to October are recorded to be the most food insecure months with food shortages highest during the period of June to September. These results indicate that the harvests of rice and wheat during the months of November and March provide sufficient food for the households.

Figure 5. Food availability and food shortage



5.2. Discussion

The results showed that 78% of the households surveyed in Rupandehi district are found to be food secure which is slightly higher than the percentage of households being food secure at the time of the baseline. The percentage of households being food insecure for more than half a year at the time of the baseline survey was three times higher than at the time of the midline survey. This suggests that households might have used higher-yielding varieties or might have cultivated crops throughout the year.

6. Land and water

6.1. Water for agriculture

Table 13 shows the percentage of households per each water source used for agricultural purposes. Borehole irrigation was found to be the main source of irrigation in the surveyed area with 66% of households using it. Similarly, water pumps and other types of irrigation were used by 50% and 49% of households respectively. 46% of the households were using irrigation, i.e., canal irrigation. Only 1% of the total households were using solar water pumps.

Table 13. Water source for agriculture on-farm

On-farm agricultural water source	% of households
Borehole	66
Irrigation	46
Water pumps	50
Solar water pumps	1
Other types	49

6.2. Land use

Table 14 shows the percentage of households owning or renting land per hectares. The majority of the households (59%), have access to less than 1 hectare of land. 37% of the households have access to between 1 to 5 hectares of land. Only 3% of households have access to more than 5 hectares of land while 1% of the total surveyed households have no access to land.

Table 14. Total land size owned or rented

Number of hectares of land owned or rented	% of households
Less than 1 hectare	59
1-5 hectares	37
More than 5 hectares	3
No land	1

6.3. Hired machinery or labour

Respondents were asked about their practices related to the renting of animal-drawn ploughs, tractors, or farm labour for the land preparation. The results show that only 6% of households have rented animal-drawn ploughs for the preparation of land. 93% of households in the surveyed block reported renting a tractor whereas 75% of the households have sometimes hired farm labour. Only 16% of households do not rent any machinery or hire any labour in the survey site.

6.4. Discussion

Boreholes were the main on-farm water sources for agricultural purposes during the midline survey, followed by water pumps and irrigation. In contrast, at the time of the baseline study, irrigation was the main water source followed by borehole and water pump. One household reported using a solar water pump during the midline survey.

Regarding land access, 59% of the households during the midline survey are found to have access to less than 1 ha of land. This is slightly higher than the percentage of households having access to this size of land at the time of the baseline study. The number of households having access to 1 to 5 ha and to more than 5 ha of land during the midline survey is slightly lower than the percentages at baseline. This suggests that a division of land into smaller plots could be the reason for these changes.

7. Inputs and credits

Table 15 shows that 96% of the households purchased seeds and inorganic fertilizers. 95% of households purchased pesticides/insecticides and 70% of the total households

purchased veterinary medicine. Only 4% of the households have access to crop and/or livestock insurance.

Table 15. Purchased input use

Last year, did you use:	Percentage of households
Purchased seed	96
Purchased inorganic fertilizer	96
Purchased pesticide/insecticide	95
Purchased organic fertilizer	20
Purchased veterinary medicine	70
Credits for agricultural activities	20
Purchased crop/livestock insurance	4

In line with the findings from the baseline survey, the majority of the households purchase inorganic fertilizers for agricultural use. Interestingly, the percentage of households purchasing seeds and inorganic pesticides has slightly increased compared to the baseline results. The percentage of households using credits for agricultural activities is also significantly higher than at the time of the baseline. This suggests that more farmers are aware of the benefits of taking agricultural loans to purchase improved seeds and pesticides to enhance their agricultural production. In contrast with findings from the baseline survey, farmers have now started buying organic fertilizers. Households have also started to take on insurance for their livestock and crops.

8. Climate and weather information

The survey captured different data surrounding the climate and weather-related information received by the surveyed households such as who is receiving the information, the types of information received and mediums of transmissions. Households receive information on extreme events, outbreaks of diseases and pests, start of the rains, weather forecast for the following 2-3 months and weather forecast for the following 2-3 days.

8.1. Who is receiving the information?

According to the survey, both men and women receive weather information. Table 16 shows that in 46% of households, both men and women receive weather information. 29% of households reported that only men receive weather information whereas in 7% of the households, it was reported that only women receive the weather information.

Table 16. Percentage of households receiving weather-related information

Recipient of weather forecast	% of households
Both men and women	46
Men only	29
Women only	7

Table 17 shows the percentage of households receiving information per sources of information. 52% of the households reported that they receive weather related information from the television, followed by 36% receiving it from friends, relatives and neighbours. However, the percentage of households receiving weather information from government agricultural extension or veterinary officers was of 14% only. 14% of households received weather related information from religious faith sources. Only 1% of households reported the source of information coming from a newspaper.

Table 17. Sources of weather-related information

Source of weather-related information	% of households
Television	52
Friends, relatives or neighbours	36
Traditional forecaster/indigenous knowledge	35
Your own observations	31
Government agricultural extension or veterinary officers	14
Religious leaders/organizations	14
Cell phones	13
Radio	6
Internet	5
Newspaper	1

8.3. Discussion

The percentage of weather-related information received by both men and women in the survey area has sharply decreased, dropping from 77% at the time of the baseline to 46% at the time of the midline. Furthermore, the percentage of weather-related information that was received by men only increased to 26% in the midline study compared to 21% at the time of the baseline study. Interestingly, the weather-related information received only by women has sharply increased to 7% from the 1% recorded at the time of the baseline.

Although many farmers still desire to receive weather-related information, they are very reluctant to believe in the information received. Since TV and radio ownership rates are high in the study area, these are the common sources of weather forecasts. However, forecasts and information related to diseases or pest outbreak are not common in Nepal.

9. Community groups

Table 18 presents the percentage of household per group membership. 59% of the households surveyed have a household member part of a savings/credits related institution. 23% of the households visited have a household member involved in irrigation groups while 22% of households have a member who is involved in a vegetable production group. 4% of the households have a household member involved in a marketing group. Only 2% of the total households have a member involved in a seed production group.

Table 18. Percentage of households having at least one member involved in group activities

Group membership	% of households
Irrigation group	23
Vegetable production	22
Savings/credits related	59
Seed production	2
Other groups	16
Agricultural product marketing	4
Not a member of any groups	25

9.1. Climate-related crisis

According to the midline survey conducted, 55% of the households have faced climate related risk in the past five years and 45% of the households did not face any climate related risk in the last five years (Table 19).

Table 19. Climate-related risk

Categories	% of households
Households faced climate related risk in the past 5 years	55
Household did not face climate related risk in the past 5years	45

9.2. Discussion

The households visited in Rupandehi district are very involved in different groups. The percentage of households with a household member engaging in a specific group has increased compared to the baseline period. The percentage of households with a member involved in a saving and credit group has decreased from 85% at the time of the baseline to 59% at the midline. However, there are more households with a household member involved in a vegetable production group or in an irrigation group compared to the baseline period.

At the time of the baseline, only 9% of the households had mentioned facing any climate related risk. In contrast, 55% of the households surveyed during the midline exercise declared having faced a climate related risk in the past 5 years. This suggests an increase in climate induced disasters in Rupandehi district.

10. Assets

10.1. Asset indicator

During the household survey, individual households were asked about the assets owned. The assets list was organized into the following categories:

- **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 was created:

0 = no assets (basic level)

1 = 1-3 assets (intermediate level)

2 = 4 or more assets (high level)

Among the surveyed households, 97% of the households owned more than four assets. 2% of the households scored the intermediate level, owning between 1 and 3 assets while only 1% of the households did not own any assets (Table 20).

Table 20. Asset index

Number of queried assets	Percentage of households
None (basic level)	1
1-3 (intermediate level)	2
4 or more (high level)	97

The results from table 21 show that 98% of the households surveyed own cell phones, 89% own a television, 10% have a radio and 16% have a computer. The majority of the households (92%) own a bicycle, while 61% of the households own a motorbike and 2% possess a car or a truck.

The assets comprising mechanical ploughs, threshers, fishing nets, water pumps or treadle pumps fall under the production category. Seven percent of the households possess a mechanical plough, 4% have a thresher, 5% have a fishing net and 54% have a water pump or treadle pump.

When asked about their housing condition, 94% of the household reported having an improved house (i.e., made up of concrete, bricks). Yet, only 48% of the surveyed households have improved roofing (i.e., tin, tiles).

Table 21. Asset ownership

Asset types	Percentage of households
Radio	10
Television	89
Cell phone	98
Computer	16
Internet access	25
Bicycle	92
Motorcycle	61
Car or truck	2
Solar panel	2
Generator (electric or diesel	4
Battery (large, e.g. car battery for power)	5
Water pump or treadle pump	54
Biogas digester	3
LPG	78
Mechanical plough	7
Thresher	4
Fishing net	5
Improved stove	1
Refrigerator	30
Air conditioning (AC)	1
Electric fan	94
Bank account	87
Motor powered spraying tank	5
Improved storage facility for crops (food or feed)	76
Water storage tank (for domestic water >500 litres)	8
Well/borehole (for household water)	81
Running/tap water in the dwelling	7
Electricity from a grid	95
Improved housing (e.g. concrete, bricks, etc.)	94
Improved roofing (e.g. tin, tiles, etc.)	48

10.2. Discussion

During the midline study, the majority of the households surveyed reported having electricity, owning bicycles and other assets in their home. Cell phones, television and radio were also the most common assets among the surveyed households. 97% of households have a high level of asset ownership. This has increased compared to the baseline where the percentage of households with a high level of assets ownership accounted for 78% of the total households surveyed.

The patterns of assets ownership in the households have changed between the baseline and the midline. The midline study indicates that many households own television, cell phone, bicycle, electric fan and have access to electricity from a grid. Moreover, compared to the baseline, the percentage of households owning motorcycles and LPG has drastically increased. However, the percentage of households with radio has decreased compared to seven years ago.

Appendices

Appendix 1. Survey process and team members

Rupandehi, a Terai district of Nepal was selected as 'core site' for CCAFS activities. The district was selected based on the gradient of climatic variability from East to West of the Indo-Gangetic Plain (Terai), and the proportionate distribution of geographical area facing climate change impacts. The villages in Rupandehi were selected by the CCAFS team at the time of the baseline survey in 2012 and the same households were visited for the midline survey seven years later, in 2019. The data was collected in consultation with the municipality's officials and other relevant stakeholders.

The survey team comprised of four enumerators, one supervisor and one team leader who visited each selected household and facilitated the data collection using the standard survey questionnaire programmed in ODK by the CCAFS survey group. The data collection team was composed as follow:

1. Mr. Roshan Pudasaini- Team Leader
2. Mr. Aastha Bhusal- Supervisor
3. Mr. Sheetal Aryal-Enumerator
4. Mr. Sauraj BK-Enumerator
5. Mr. Niraj Mishra- Enumerator
6. Mr. Sagar Paudel- Enumerator

A complete list of households within each village was generated for the baseline and reused for the midline survey. From each village, a total of 20 households were sampled for the survey. The questionnaire was administered on the person most able to respond to the questions asked. Other household members were also involved in answering the questions.

Appendix 2: List of villages for the midline household survey

The names of the villages where the household midline survey in the Rupandehi district where conducted were:

VILLID	Name of the municipalities
NE 0301	Chilhiya-8, Madhuwan Tole
NE 0302	Hatibangai -1, Bangaitole
NE 0303	Hatibangai-6, Mauwaritole
NE 0304	Hatibangain-2, Bairiyatole
NE 0305	Hatibangain-9, Marchahawa
NE 0306	Tikuligadh-4, Rehara
NE 0307	Basantapur-6, Madhuritole