

Increasing Women's Resilience to Confront Climate Change Project

IFPRI Gender Survey Data Report: Bangladesh

Climate Change Agriculture & Food Security

Md. Imrul Hassan

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1. Introduction

The gender survey was conducted between April and May 2013 and the main objective was to enhance understanding of gendered climate change perceptions, impacts, and adaptation and coping strategies within the CCAFS research site in Bangladesh. Findings of this study will be used by researchers, policy-makers and development practitioners to better understand the vulnerabilities of men and women to climate change, how they differ, and what actions can be taken to reduce those vulnerabilities.

This report describes various important concerns and different steps relating to the design of the survey. Various steps taken to make the general survey methodology, the field survey methodology. This report presents a descriptive analysis of key issues or variables that highlight the state of affairs of the farmers, focusing on land ownership, exposure to agriculture and weather information, access to credit, extension and other services, decision-making roles, networks, access to energy and water, climatic shocks experienced in the study area and how farmers have responded and planned for the future and farmers' perceptions of important personal and community values.

This report presents the description of data that was collected in the survey. Any discussions contained herein are limited to the data statistics presented. The report neither includes analysis that depicts relationships between variables nor their causes. The report is arranged as follows: section 2 presents a brief description of methods used, section 3 presents the description of data.

2. Methods and procedures

The gender survey was conducted between April and May 2013. Data collection was preceded by the training of the research team that helped to understand the objectives of the survey, interpretation of questions and how to record data. The survey questionnaire was pre-tested at the same time and necessary adjustments were made before data collection. Data was collected on the three previous agricultural seasons, that is, from August 2011 to August 2012. The survey covered the same households that were sampled for the IMPACT Lite surveys and is intended to supplement the detailed productivity related information.

2.1 The sample

Survey respondents were pooled from 44 villages located in 3 Upazilas Bagerhat and Satkhira districts. A total of 196, out of the 202 households targeted in Morrelganj Upazila of Bagerhat District, were covered in this research study. The total number of respondents that were interviewed from these households was 360 comprising of 167 males and 192 females.

A total of 220 households sampled in Satkhira District, 159 households in Kaliganj and 61 households in Shymnagar Upazila, were covered in this research study.

The total number of respondents that were interviewed from these households was 433 comprising of 380 males and 412 females. Table 1 presents the number of respondents that were selected from each of the Upazilas in the research block.

Table 1: Number of respondents selected from each Upazila

District	Upazila	Number of Interview done	Number of household Interviewed	Number of household Interviewed both Male & Female	Number of household Interviewed Male Part Only as There is no Adult Female in household	Number of household Interviewed Male Part Only as There is no Adult Male in household	Number of household Not Interviewed as The households Migrated
Bagerhat	Morelganj	360	196	166	1	26	3
Satkhira	Kaliganj	313	159	154	0	5	0
Satkhira	Shymnagar	120	61	59	0	2	0
Total		793	416	379	1	33	3

2.2 Data

Gender-disaggregated data was gathered on climate change perceptions, agricultural activities, decision-making, weather information, risk perception, and adaptation. Information was also collected on assets, farming decisions, agricultural practices, respondents' access to information, extension services, and credit; and their participation in community groups. Data was gathered through use of questionnaires administered through face-to-face interviews. Two adult decision makers (one male and one female) were interviewed separately per household in order to generate independent perceptions.

3. Description of data: findings from the study

The following sub-sections describe the collected data. For purposes of clarity and coherence, the presented description follows the questions as presented in the survey questionnaire.

3.1 Household characteristics

3.1.1 Members of households

Following on the Gender household survey, the total number of household members living with household are 3,580 comprising of 1,740 (49%) males and 1,840 (51%) females. The average household family size was 4.51 members. Males constituted the majority of household heads (96%) while women constituted the minority.

3.3.2 Education level of household members

Out of a total of 3,769 household members that had school going age (above six years) 3,395 household members, 49% of men and 51% of women had primary education (up to 7 years of formal schooling); 48% males and 52% females had between eight and 11 years of school (ordinary level); and 69% males and 31% females had more than 12 years of education (high school and above).

These statistics show that women form the majority of the category that has with in high school education (up to 11 years of school) while men constitute the majority that has above high school education.

3.3.3 Disability in households

Out of the surveyed 3,769 household members, 567 (15%) were mentioned to be disabled or chronically ill. These were constituted by 43% males and 57% females.

3.2 Ownership of land and decisions on plots

3.2.1 Land ownership

Total of 381 households out of the surveyed 416 households owned 1,526 total plots, split into 3,967 subplots. Majority of plots (48%) were owned while 43% were being rented-in. Only 2% of the plots had title deeds while 38% held customary tenure (inherited, family, or clan land). In addition, a reasonable proportion of households (49%) had written agreements while 0.3% had lease from government. It can be observed that although majority of farmers own the land they use for production, many do not have security of tenure, in terms of agreements endorsed by local councils, leases or title deeds. In Bangladesh, land acquisition agreements endorsed by local council 1 are legally binding.

Table 2: Land title

Land Title	Own land and own use	Renting in (respondent pays rent)	Other
Government title	43.3	50.0	0.0
Customary tenure [no written title: inherited, family]	56.2	0.0	0.0
No title	0.2	0.0	0.0
Leased in from government	0.0	0.0	75.0
Private lease	0.0	50.0	0.0
Other	0.3	0.0	25.0

Table 3: Land ownership by land title

Land Title	Own land and own use				Renting in (respondent pays rent)				Total			
	Male		Female		Male		Female		Male		Female	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Government title	381	95.0	20	5.0	2	100.0	0	0	383	95.0	20	5.0
Customary tenure [no written title: inherited, family]	492	94.3	30	5.7	0	0.0	0	0	492	94.3	30	5.7

Regarding ownership of plots of land, 74% of the plots were owned by the head of the household who were constituted by 77% men. A minority of plots (6%) were jointly owned by the household head and the second decision-maker, who were mainly women (91%). Only 5% of the plots were owned by non-household members. In addition, 11% of the plots were either being rented in/sharecropped in/cost shared or it was borrowed land. Other plot owners received insignificant scores.

3.2.2 Distribution of crop enterprises across sub-plots

Analysis of the subplot/enterprise information revealed that paddy existed in 37% of the sub-plots (in 1,815 out of the 4,854 sub-plots). This is the number of times paddy was mentioned either as being intercropped with another crop or as a separate crop occupying the entire subplot. This was followed by vegetables with 906 (18%) and wheat 561(11%) (Table 4).

Table 4: Number of subplots/crops

Crop	Freq.	%
Fallow	495	10.20
Paddy	1815	37.39
Wheat	561	11.56
Maize	245	5.05
Sorghum/pearl millet	28	0.58
Barley/Oat	19	0.39
Other millet/grain	10	0.21
Gram	8	0.16
Moong bean	13	0.27
Tur/red gram/pigeon pea	3	0.06
Lethyrus	30	0.62
Other pulses	1	0.02
Pulses in general	1	0.02
Vegetables	906	18.67
Potato	46	0.95
Onions	6	0.12
Mustard seed	10	0.21
Lin seed	2	0.04
Sun flower seed	1	0.02
Fodder crop	4	0.08
Sugar cane	52	1.07
Banana	71	1.46
Citrus	3	0.06
Fruit in general	10	0.21
Other	73	1.50
Aquaculture fish (salty water)	25	0.52
Aquaculture fish (fresh water)	333	6.86
Aquaculture prawns	69	1.42
Aquaculture shrimp	6	0.12
Aquaculture other	8	0.16
Total	4854	100

Most of agricultural decisions on the use of plots/subplots (68.1%) were made separately by individual spouses either as males or females separately. A minority of decisions (26.4%) were either made jointly by both spouses or by the household head and another household member.

Data

Table 5: Agricultural decisions on the use of plots/subplots: Responses from male respondent:

Crop	Household head			Spouse			Son/Daughter			Son/ daughter in law	Father/ Mother			Other relative	Total		
	Individual	Multiple	Joint	Individual	Multiple	Joint	Individual	Multiple	Joint	Individual	Individual	Multiple	Joint	Individual	Individual	Multiple	Joint
Fallow	83.3	3.6	13.1	100.0			100.0				100.0				83.8	3.5	12.7
Paddy	73.6	2.5	23.8	90.9		9.1	55.9	44.1			59.1	9.1	31.8	100.0	73.2	3.7	23.1
Wheat	71.1	7.1	21.8	100.0			71.4	28.6			85.7	14.3		100.0	71.8	8.7	19.5
Maize	61.2	5.4	33.3	100.0								100.0		100.0	62.2	5.9	31.9
Sorghum/pearl millet	72.2	16.7	11.1									100.0			68.4	21.1	10.5
Barley/Oat	90.9		9.1	100.0											91.7		8.3
Other millet/grain	85.7		14.3												85.7		14.3
Gram	60.0		40.0												60.0		40.0
Moong bean	22.2		77.8			100.0									20.0		80.0
Lethyrus	93.3	6.7													93.3	6.7	
Other pulses	100.0														100.0		
Pulses in general	100.0														100.0		
Vegetables	48.6	0.4	51.0	69.1		30.9	100.0				40.0	10.0	50.0		50.5	0.8	48.8
Potato	81.0		19.0	50.0		50.0									79.5		20.5
Onions	75.0		25.0												75.0		25.0
Mustard seed	100.0														100.0		
Lin seed	100.0														100.0		
Fodder crop	33.3		66.7			100.0									25.0		75.0
Sugar cane	76.2		23.8										100.0		66.7		33.3
Banana	37.5	2.5	60.0			100.0					100.0				39.5	2.3	58.1
Citrus			100.0														100.0
Fruit in general	66.7		33.3												66.7		33.3
Other	72.9		27.1	50.0		50.0					33.3		66.7		68.4		31.6
Aquaculture fish (salty water)	88.9		11.1												88.9		11.1
Aquaculture fish (fresh water)	71.5	5.0	23.5			100.0	100.0				50.0	16.7	33.3		70.4	5.2	24.4
Aquaculture prawns	48.4	1.6	50.0												48.4	1.6	50.0
Aquaculture shrimp	100.0						100.0								100.0		
Aquaculture other	75.0		25.0	100.0											80.0		20.0

Table 6: Agricultural decisions on the use of plots/subplots: Responses from female respondent

Crop	Household head			Spouse			Son/Daughter			Son/ daughter in law	Father/ Mother			Other relative	Total		
	Individual	Multiple	Joint	Individual	Multiple	Joint	Individual	Multiple	Joint	Individual	Individual	Multiple	Joint	Individual	Individual	Multiple	Joint
Fallow	82.0	1.8	16.2	100.0			100.0			100.0	100.0				83.8	1.6	14.6
Paddy	72.7	4.9	22.4	77.3		22.7	71.4	26.5	2.0		100.0			100.0	73.6	5.5	20.9
Wheat	62.3	8.4	29.2	50.0		50.0	70.8	29.2			100.0			100.0	63.5	9.4	27.1
Maize	58.3	7.6	34.1	100.0			100.0				100.0			100.0	61.3	7.0	31.7
Sorghum/pearl millet	69.2	23.1	7.7	100.0										100.0	75.0	18.8	6.3
Barley/Oat	88.9		11.1	100.0										100.0	90.9		9.1
Other millet/grain	100.0			100.0											100.0		
Gram	66.7		33.3	100.0											75.0		25.0
Moong bean	100.0			100.0							100.0				100.0		
Lethyrus	82.8		17.2												82.8		17.2
Other pulses	100.0														100.0		
Pulses in general	100.0														100.0		
Vegetables	38.8	4.7	56.5	86.9	1.2	11.9	100.0			100.0	100.0			100.0	48.6	4.0	47.4
Potato	67.5		32.5	100.0											69.8		30.2
Onions	60.0		40.0												60.0		40.0
Mustard seed	66.7	22.2	11.1												66.7	22.2	11.1
Lin seed	50.0		50.0												50.0		50.0
Fodder crop	33.3		66.7	100.0											50.0		50.0
Sugar cane	62.9		37.1												62.9		37.1
Banana	28.6	2.0	69.4	50.0		50.0					100.0			100.0	36.2	1.7	62.1
Citrus			100.0														100.0
Fruit in general			100.0			100.0											100.0
Other	66.7	3.9	29.4	100.0							100.0				71.2	3.4	25.4
Aquaculture fish (salty water)	55.6		44.4												55.6		44.4
Aquaculture fish (fresh water)	68.5	4.7	26.8	62.5	12.5	25.0	100.0				100.0				69.0	4.8	26.2
Aquaculture prawns	36.5	1.6	61.9												36.5	1.6	61.9
Aquaculture shrimp	100.0						100.0								100.0		
Aquaculture other	100.0														100.0		

3.3 Decision-making

This section identifies the agricultural and livestock production final decision-makers for the various activities conducted in the management of crops and animals. In crop production, due to the repetitive nature of crop enterprises across sub-plots, the decision-making has been looked at in terms of crop enterprises, instead of plots and sub-plots.

3.3.1 Agricultural production final decisions on crops

The major crops enterprises were paddy, vegetables and wheat, there were some pond-based cropping also present in the study, aquaculture fish (fresh water) was another major crop. Each of these crops accounted for over 37%, 18%, 11% and 6% accordingly of the total number of subplots for all the crops in the study. There were Table 7 presents a summary of major decisions and the makers in the production of the five major enterprises.

Table 7: Decision-making in crop enterprises

Crop	Type of decision	Who makes the decision (%)			
		HH head alone	Joint with second DM	Second DM alone	No Decision
Paddy	What crops to plant (or whether to fallow or keep perennial crops)	60.97	25.29	9.45	4.29
	Land Preparation (When to clear and plow; which methods to use and labor)	59.31	22.65	8.14	9.90
	Inputs to be used (What variety and type of fertilizers and seeds)	59.75	22.09	9.27	8.90
	Planting (Labor hired, timing, machinery or animal power)	59.73	21.69	9.03	9.55
	Weeding (When, hiring of labor, use of herbicides, management of weeds)	61.15	20.75	8.54	9.57
	Crop Management (Top Dressing, disease control, pest management, irrigation)	62.25	21.10	7.33	9.33
	Harvesting (When to Harvest, how to harvest, transport from field)	56.18	27.65	7.30	8.87
	Post Harvesting or Processing	33.33	45.98	11.30	9.39
	Use of Crop (sale, consumption, gift, value addition, etc)	33.65	46.45	9.52	10.38
	Use of Income from the sale of crops	36.24	27.51	3.93	32.31
Wheat	What crops to plant (or whether to fallow or keep perennial crops)	41.94	37.90	13.71	6.45
	Land Preparation (When to clear and plow; which methods to use and labor)	37.90	26.61	4.84	30.65
	Inputs to be used (What variety and type of fertilizers and seeds)	38.52	28.69	4.10	28.69
	Planting (Labor hired, timing, machinery or animal power)	37.70	29.51	4.10	28.69
	Weeding (When, hiring of labor, use of herbicides, management of weeds)	38.84	27.27	4.13	29.75
	Crop Management (Top Dressing, disease control, pest management, irrigation)	39.17	26.67	4.17	30.00
	Harvesting (When to Harvest, how to harvest, transport from field)	29.17	36.67	5.00	29.17
	Post Harvesting or Processing	21.01	45.38	4.20	29.41

Crop	Type of decision	Who makes the decision (%)			
		HH head alone	Joint with second DM	Second DM alone	No Decision
	Use of Crop (sale, consumption, gift, value addition, etc)	18.33	47.50	5.00	29.17
	Use of Income from the sale of crops	10.00	33.33	1.67	55.00
Vegetables	What crops to plant (or whether to fallow or keep perennial crops)	33.73	52.98	13.19	0.10
	Land Preparation (When to clear and plow; which methods to use and labor)	37.43	46.93	15.45	0.20
	Inputs to be used (What variety and type of fertilizers and seeds)	37.72	45.97	16.11	0.20
	Planting (Labor hired, timing, machinery or animal power)	35.98	48.46	15.36	0.20
	Weeding (When, hiring of labor, use of herbicides, management of weeds)	36.65	45.81	16.35	1.18
	Crop Management (Top Dressing, disease control, pest management, irrigation)	41.49	42.77	15.34	0.39
	Harvesting (When to Harvest, how to harvest, transport from field)	30.96	52.44	16.40	0.20
	Post Harvesting or Processing	24.90	55.69	19.21	0.20
	Use of Crop (sale, consumption, gift, value addition, etc)	24.64	55.62	18.00	1.74
	Use of Income from the sale of crops	31.22	38.93	8.88	20.98
Aquaculture fish (fresh water)	What crops to plant (or whether to fallow or keep perennial crops)	61.40	30.99	7.31	0.29
	Land Preparation (When to clear and plow; which methods to use and labor)	62.36	25.57	6.90	5.17
	Inputs to be used (What variety and type of fertilizers and seeds)	64.71	26.47	6.76	2.06
	Planting (Labor hired, timing, machinery or animal power)	64.69	27.00	5.93	2.37
	Weeding (When, hiring of labor, use of herbicides, management of weeds)	62.25	25.07	5.19	7.49
	Crop Management (Top Dressing, disease control, pest management, irrigation)	63.53	25.88	5.29	5.29
	Harvesting (When to Harvest, how to harvest, transport from field)	55.09	37.13	7.49	0.30
	Post Harvesting or Processing	43.53	44.48	11.99	0.00
	Use of Crop (sale, consumption, gift, value addition, etc)	43.89	44.20	10.34	1.57
	Use of Income from the sale of crops	46.86	24.57	2.86	25.71

3.3.2 Livestock production decisions

Table 8 indicates decision-making in livestock enterprises. Major livestock enterprises included local and Improved cattle, local and Improved goats, poultry and Fish.

Table 8: Decision-making regarding livestock production

Type of decision	Who makes the decision (% response)							
	HH head alone		Individually both HH head or second DM		Joint with second DM		Second DM alone	
	Male	Female	Male	Female	Male	Female	Male	Female
Cattle (local)								
Watering (where, when, etc)	40.21	25.85	23.28	23.41	8.47	15.61	28.04	35.12
Feeding (what to feed animals, when, and who feeds them)	41.15	25.36	22.92	27.27	9.38	15.31	26.56	32.06
Veterinary treatment	49.49	38.03	26.77	30.05	4.04	5.63	19.70	26.29
Housing (what type and where)	43.88	35.21	34.18	31.92	7.65	9.39	14.29	23.47
Grazing (where, when, etc)	46.19	35.51	22.34	22.90	6.60	12.15	24.87	29.44
Breeding	38.50	33.95	33.00	24.19	3.00	6.05	25.50	35.81
Production of milk	27.41	21.00	21.83	21.00	2.54	8.22	48.22	49.77
Use of Milk Products	11.11	7.34	15.15	15.60	-	5.96	73.74	71.10
Slaughtering	1.97	-	2.46	0.91	-	1.36	95.57	97.73
Production of Other products (leather, wool, eggs, honey)	1.97	0.45	3.45	1.36	-	0.90	94.58	97.29
Use of other product (meat or other) (sale, consumption, gift, etc.)	14.50	9.17	14.50	11.93	3.50	7.34	67.50	71.56
Use of Income from Sale of product (if sold)	11.44	10.45	17.91	10.45	1.49	4.09	69.15	75.00
Sale of disposal	2.48	2.71	1.98	0.90	-	-	95.54	96.38
Income from sale	2.48	3.17	1.49	0.45	-	-	96.04	96.38
Cattle (Improved)								
Watering (where, when, etc)	17.14	15.00	20.00	17.50	-	2.50	62.86	65.00
Feeding (what to feed animals, when, and who feeds them)	20.00	15.38	22.86	20.51	-	2.56	57.14	61.54
Veterinary treatment	26.47	23.08	20.59	17.95	-	-	52.94	58.97
Housing (what type and where)	22.86	22.50	22.86	20.00	2.86	-	51.43	57.50
Grazing (where, when, etc)	11.43	14.29	17.14	11.90	-	-	71.43	73.81
Breeding	14.29	12.50	20.00	10.00	2.86	-	62.86	77.50
Production of milk	2.86	2.38	17.14	11.90	-	-	80.00	85.71
Use of Milk Products	2.86	-	14.29	11.90	-	-	82.86	88.10
Slaughtering	8.57	5.00	-	10.00	5.71	7.50	85.71	77.50
Production of Other products (leather, wool, eggs, honey)	11.43	2.50	2.86	7.50	-	2.50	85.71	87.50
Use of other product (meat or other) (sale, consumption, gift, etc.)	14.29	12.50	20.00	25.00	5.71	10.00	60.00	52.50
Use of Income from Sale of product (if sold)	11.43	9.52	20.00	26.19	-	4.76	68.57	59.52
Sale of disposal	-	-	-	-	-	-	100.00	100.00
Income from sale	-	-	-	-	-	-	100.00	100.00
Goats (local)								
Watering (where, when, etc)	22.22	19.33	7.41	13.45	8.33	7.56	62.04	59.66
Feeding (what to feed animals, when, and who feeds them)	22.02	17.89	11.01	17.07	7.34	8.94	59.63	56.10
Veterinary treatment	27.19	21.26	18.42	29.13	1.75	3.94	52.63	45.67
Housing (what type and where)	25.23	20.97	24.32	28.23	4.50	5.65	45.95	45.16
Grazing (where, when, etc)	20.35	16.13	11.50	14.52	5.31	6.45	62.83	62.90
Breeding	25.44	17.60	17.54	21.60	2.63	4.80	54.39	56.00
Production of milk	7.89	3.91	1.75	6.25	0.88	6.25	89.47	83.59
Use of Milk Products	2.61	2.34	1.74	4.69	-	3.91	95.65	89.06
Slaughtering	1.72	0.78	1.72	3.10	1.72	-	94.83	96.12

Type of decision	Who makes the decision (% response)							
	HH head alone		Individually both HH head or second DM		Joint with second DM		Second DM alone	
	Male	Female	Male	Female	Male	Female	Male	Female
Production of Other products (leather, wool, eggs, honey)	1.72	0.78	1.72	1.55	-	-	96.55	97.67
Use of other product (meat or other) (sale, consumption, gift, etc.)	6.09	4.65	16.52	13.18	2.61	4.65	74.78	77.52
Use of Income from Sale of product (if sold)	5.22	5.47	17.39	12.50	1.74	2.34	75.65	79.69
Sale of disposal	-	0.78	-	-	-	-	100.00	99.22
Income from sale	-	0.78	-	-	-	-	100.00	99.22
Goats (improved)								
Watering (where, when, etc)	45.45	25.00	9.09	18.75	9.09	6.25	36.36	50.00
Feeding (what to feed animals, when, and who feeds them)	45.45	18.75	-	25.00	9.09	6.25	45.45	50.00
Veterinary treatment	45.45	25.00	-	12.50	9.09	-	45.45	62.50
Housing (what type and where)	54.55	31.25	-	18.75	9.09	6.25	36.36	43.75
Grazing (where, when, etc)	18.18	12.50	-	-	-	-	81.82	87.50
Breeding	18.18	6.25	9.09	6.25	-	6.25	72.73	81.25
Production of milk	-	-	-	-	-	-	100.00	100.00
Use of Milk Products	-	-	-	-	-	-	100.00	100.00
Slaughtering	9.09	6.25	9.09	6.25	-	-	81.82	87.50
Production of Other products (leather, wool, eggs, honey)	-	-	-	-	-	-	100.00	100.00
Use of other product (meat or other) (sale, consumption, gift, etc.)	45.45	12.50	18.18	18.75	-	12.50	36.36	56.25
Use of Income from Sale of product (if sold)	36.36	12.50	9.09	18.75	9.09	6.25	45.45	62.50
Sale of disposal	-	-	-	-	-	-	100.00	100.00
Income from sale	-	-	-	-	-	-	100.00	100.00
Poultry								
Watering (where, when, etc)	2.10	5.79	0.70	0.61	0.35	0.30	96.85	93.29
Feeding (what to feed animals, when, and who feeds them)	0.72	4.63	1.08	0.93	0.36	0.31	97.85	94.14
Veterinary treatment	1.72	5.12	6.90	5.72	1.03	1.20	90.34	87.95
Housing (what type and where)	2.70	4.53	13.51	5.44	1.01	1.21	82.77	88.82
Grazing (where, when, etc)	-	-	-	-	-	-	100.00	100.00
Breeding	0.34	3.93	-	0.91	-	0.30	99.66	94.86
Production of milk	-	-	-	-	-	-	100.00	100.00
Use of Milk Products	-	-	-	-	-	-	100.00	100.00
Slaughtering	1.02	2.79	23.81	8.98	3.40	2.48	71.77	85.76
Production of Other products (leather, wool, eggs, honey)	1.37	3.09	4.12	7.10	0.69	0.93	93.81	88.89
Use of other product (meat or other) (sale, consumption, gift, etc.)	1.68	3.65	10.40	12.16	3.69	2.43	84.23	81.76
Use of Income from Sale of product (if sold)	3.01	2.69	7.69	9.88	2.01	2.69	87.29	84.73
Sale of disposal	-	-	-	-	0.33	-	99.67	100.00
Income from sale	0.33	-	-	-	-	-	99.67	100.00
Fish								
Watering (where, when, etc)	38.10	42.99	28.04	21.96	5.29	6.54	28.57	28.50
Feeding (what to feed animals, when, and who feeds them)	43.24	50.48	33.51	25.24	9.73	8.10	13.51	16.19
Veterinary treatment	35.64	42.72	28.19	19.72	2.66	3.29	33.51	34.27
Housing (what type and where)	33.69	35.38	27.27	19.81	3.74	6.13	35.29	38.68

Type of decision	Who makes the decision (% response)							
	HH head alone		Individually both HH head or second DM		Joint with second DM		Second DM alone	
	Male	Female	Male	Female	Male	Female	Male	Female
Grazing (where, when, etc)	-	0.46	-	-	-	-	100.00	99.54
Breeding	2.08	0.92	1.04	1.38	-	-	96.88	97.71
Production of milk	-	-	-	-	-	-	100.00	100.00
Use of Milk Products	-	-	-	-	-	-	100.00	100.00
Slaughtering	9.52	13.55	24.87	16.82	3.70	2.34	61.90	67.29
Production of Other products (leather, wool, eggs, honey)	2.62	2.31	0.52	0.93	1.05	-	95.81	96.76
Use of other product (meat or other) (sale, consumption, gift, etc.)	33.69	25.36	32.62	38.28	9.09	10.53	24.60	25.84
Use of Income from Sale of product (if sold)	30.16	20.09	15.87	23.83	3.17	7.01	50.79	49.07
Sale of disposal	1.04	0.46	-	0.46	0.52	-	98.44	99.08
Income from sale	1.04	0.46	-	0.46	0.52	-	98.44	99.08

Table excludes cases where no decision was made

3.3.3 Final decision maker on key livelihood aspects

Information was solicited on who makes final decisions in a household. Table 9 presents key responses to the question.

Table 9: Final decision-making roles in the household

Activities	Who makes the decision (% response)					
	HH head alone		Joint with second DM		Second DM alone	
	Male	Female	Male	Female	Male	Female
Major farm investments to make (machinery, infrastructure, irrigation, etc)	5.61	8.01	3.74	9.95	90.64	82.04
Buying or selling land	4.01	3.39	5.35	7.26	90.64	89.35
Renting land	27.49	15.98	16.44	17.43	56.06	66.59
Whether or not respondent engages in non-farm business activity (shop, tailoring, etc)	55.73	7.97	6.13	7.49	38.13	84.54
Whether or not respondent engages in salary or wage employment	61.87	5.57	5.33	7.99	32.80	86.44
Major household expenditures (appliances, furniture, radios, etc)	23.56	14.60	33.70	44.55	42.74	40.84
Household food expenditures	32.50	19.25	57.50	73.25	10.00	7.50
Minor household non-food expenditures (daily staples, clothing, school supplies)	32.42	18.05	59.07	71.93	8.52	10.03
How respondent spends own money (from non-farm sources or wage employment)	65.60	4.37	14.40	10.19	20.00	85.44

% calculated based on total number of responses by gender that were aware of each practice.

*Household heads were majorly men, second decision-makers were mainly women.

3.4 Agricultural practices

Information was sought as to whether respondents were aware of the various agricultural practices. Table 10 presents a summary of responses to this question.

Table 10: Awareness of the various farming practices by gender

Practice	Male		Female		Total	
	Freq.	%	Freq.	%	Freq.	%
Agroforestry	207	56.10	174	42.34	381	48.85
Terraces, Bunds	113	30.54	125	30.41	238	30.47
Water Harvesting (Dams, Ditch, Water Pans)	98	26.49	73	17.72	171	21.87
Irrigation	365	98.38	402	97.57	767	97.96
Zai Pits/Planting Pits/Negarims	24	6.50	6	1.47	30	3.86
Leaving Crop Residue	216	58.54	217	52.93	433	55.58
Composting	301	81.13	294	71.36	595	75.99
Livestock manure management	241	65.31	248	60.34	489	62.69
More efficient use of fertilizer	329	88.92	232	56.59	561	71.92
Improved, high yielding varieties	233	63.49	168	41.18	401	51.74
Stress-tolerant varieties	12	3.27	8	1.98	20	2.59
No till/Minimum tillage	113	30.79	114	27.94	227	29.29
Improved grain storage	156	42.51	156	38.14	312	40.21
Improved Stoves (wood or charcoal)	261	70.54	282	69.12	543	69.79
Improved feed management (livestock)	112	30.52	109	26.59	221	28.44
Destocking	58	15.80	11	2.68	69	8.88
Cover Cropping	51	13.90	38	9.29	89	11.47
Switching to drought or pest tolerant species/breeds	24	6.54	7	1.71	31	3.99
Grazing, Pasture, or Rangeland Management?	31	8.45	8	1.96	39	5.03
Integrated Pest Management?	293	80.27	258	63.55	551	71.47

% calculated based on total number of responses by gender that were aware of each practice

3.5.1 Forecast of drought, floods and extreme events

Table 11: Access to various types of information in relation to gender

Information type	% Responses showing access to information					
	Male		Female		Total	
	Freq.	%	Freq.	%	Freq.	%
Forecast of drought, flood or extreme events	219	59.03	306	74.09	525	66.96
Forecast for the start of the rains	183	49.33	278	67.15	461	58.73
Short-term forecast (1 day-1 week in advance)	89	24.05	108	26.02	197	25.10
Long-term weather forecasts (1 year or more in advance)	15	4.05	3	0.72	18	2.30
Information on crop production and management	110	29.57	58	14.01	168	21.37
Information on livestock production and management	53	14.29	52	12.56	105	13.38
Pest and disease outbreaks and management	104	28.11	81	19.57	185	23.60
Post harvest handling	31	8.49	26	6.39	57	7.38

3.5.10 Most desired information

Table 12: Most desired information

Desired Group	Information type	Male		Female		Total	
		Freq.	%	Freq.	%	Freq.	%
1st most desired	Forecast of drought, flood or extreme events	92	24.93	44	10.81	136	17.53
	Forecast for the start of the rains	39	10.57	44	10.81	83	10.70
	Seasonal weather forecast (for long rains or short rains)	47	12.74	45	11.06	92	11.86
	Short-term forecast (1 day-1 week in advance)	21	5.69	23	5.65	44	5.67
	Long-term weather forecasts (1 year or more in advance)	38	10.30	64	15.72	102	13.14

Desired Group	Information type	Male		Female		Total	
		Freq.	%	Freq.	%	Freq.	%
	Information on crop production and management	44	11.92	70	17.20	114	14.69
	Information on livestock production and management	22	5.96	43	10.57	65	8.38
	Pest and disease outbreaks and management	26	7.05	54	13.27	80	10.31
	Post harvest handling	40	10.84	20	4.91	60	7.73
	Total	369	100.00	407	100.00	776	100.00
2nd most desired	Forecast of drought, flood or extreme events	26	5.46	24	4.60	50	5.01
	Forecast for the start of the rains	74	15.55	34	6.51	108	10.82
	Seasonal weather forecast (for long rains or short rains)	53	11.13	68	13.03	121	12.12
	Short-term forecast (1 day-1 week in advance)	54	11.34	40	7.66	94	9.42
	Long-term weather forecasts (1 year or more in advance)	74	15.55	58	11.11	132	13.23
	Information on crop production and management	63	13.24	61	11.69	124	12.42
	Information on livestock production and management	58	12.18	97	18.58	155	15.53
	Pest and disease outbreaks and management	45	9.45	92	17.62	137	13.73
	Post harvest handling	29	6.09	48	9.20	77	7.72
	Total	476	100.00	522	100.00	998	100.00
3rd most desired	Forecast of drought, flood or extreme events	19	6.21	11	3.22	30	4.63
	Forecast for the start of the rains	28	9.15	17	4.97	45	6.94
	Seasonal weather forecast (for long rains or short rains)	54	17.65	61	17.84	115	17.75
	Short-term forecast (1 day-1 week in advance)	50	16.34	28	8.19	78	12.04
	Long-term weather forecasts (1 year or more in advance)	38	12.42	40	11.70	78	12.04
	Information on crop production and management	24	7.84	33	9.65	57	8.80
	Information on livestock production and management	32	10.46	55	16.08	87	13.43
	Pest and disease outbreaks and management	35	11.44	52	15.20	87	13.43
	Post harvest handling	26	8.50	45	13.16	71	10.96
	Total	306	100.00	342	100.00	648	100.00

Table 13: Most desired information type

Information type	Desired Group	Male		Female		Total	
		Freq.	%	Freq.	%	Freq.	%
Forecast of drought, flood or extreme events	1st most desired	92	67.15	44	55.70	136	62.96
	2nd most desired	26	18.98	24	30.38	50	23.15
	3rd most desired	19	13.87	11	13.92	30	13.89
	Total	137	100.00	79	100.00	216	100.00
Forecast for the start of the rains	1st most desired	39	27.66	44	46.32	83	35.17
	2nd most desired	74	52.48	34	35.79	108	45.76
	3rd most desired	28	19.86	17	17.89	45	19.07
	Total	141	100.00	95	100.00	236	100.00
Seasonal weather forecast (for long rains or short rains)	1st most desired	47	30.52	45	25.86	92	28.05
	2nd most desired	53	34.42	68	39.08	121	36.89
	3rd most desired	54	35.06	61	35.06	115	35.06
	Total	154	100.00	174	100.00	328	100.00
Short-term forecast (1 day-1 week in	1st most desired	21	16.80	23	25.27	44	20.37

Information type	Desired Group	Male		Female		Total	
		Freq.	%	Freq.	%	Freq.	%
advance)	2nd most desired	54	43.20	40	43.96	94	43.52
	3rd most desired	50	40.00	28	30.77	78	36.11
	Total	125	100.00	91	100.00	216	100.00
Long-term weather forecasts (1 year or more in advance)	1st most desired	38	25.33	64	39.51	102	32.69
	2nd most desired	74	49.33	58	35.80	132	42.31
	3rd most desired	38	25.33	40	24.69	78	25.00
	Total	150	100.00	162	100.00	312	100.00
Information on crop production and management	1st most desired	44	33.59	70	42.68	114	38.64
	2nd most desired	63	48.09	61	37.20	124	42.03
	3rd most desired	24	18.32	33	20.12	57	19.32
	Total	131	100.00	164	100.00	295	100.00
Information on livestock production and management	1st most desired	22	19.64	43	22.05	65	21.17
	2nd most desired	58	51.79	97	49.74	155	50.49
	3rd most desired	32	28.57	55	28.21	87	28.34
	Total	112	100.00	195	100.00	307	100.00
Pest and disease outbreaks and management	1st most desired	26	24.53	54	27.27	80	26.32
	2nd most desired	45	42.45	92	46.46	137	45.07
	3rd most desired	35	33.02	52	26.26	87	28.62
	Total	106	100.00	198	100.00	304	100.00
Post harvest handling	1st most desired	40	42.11	20	17.70	60	28.85
	2nd most desired	29	30.53	48	42.48	77	37.02
	3rd most desired	26	27.37	45	39.82	71	34.13
	Total	95	100.00	113	100.00	208	100.00

3.6 Sources of agricultural and/or climate information in the last 12 months

Table 14: Sources of agricultural information in the previous 12 months.

Information sources	%responses depicting access to agricultural/climate information					
	Male		Female		Total	
	Freq.	%	Freq.	%	Freq.	%
Government Extension Workers	114	30.81	25	6.11	139	17.84
NGOs	52	14.05	41	10.00	93	11.92
Community Meetings	9	2.43	2	0.49	11	1.41
Farmer Organizations, Coops, CBOs	6	1.62	4	0.98	10	1.28
Research organization/ researcher	2	0.54	0	0.00	2	0.26
Religious groups	17	4.59	2	0.49	19	2.44
Agri-service providers, Seed companies	51	13.78	21	5.13	72	9.24
Family members	187	50.54	330	80.49	517	66.28
Neighbors	264	71.35	359	87.56	623	79.87
Radio	220	59.46	127	30.98	347	44.49
TV	324	87.57	226	55.26	550	70.60
Newspaper/bulletin	53	14.32	18	4.40	71	9.11
Schools/teachers	8	2.16	5	1.22	13	1.67
Cell phone	7	1.89	5	1.22	12	1.54
Internet	204	55.14	161	39.36	365	46.85
Traditional forecasters/indigenous knowledge; own knowledge	2	0.54	0	0.00	2	0.26
Agricultural Shows	46	12.43	3	0.73	49	6.29
Farmer Field Days/Demonstrations	1	0.27	0	0.00	1	0.13

% calculated based on total women and total men in the sample

3.6.2 Most useful sources of agricultural information

Table 15: Most useful sources of agricultural information

Desired Group	Information sources	%responses most useful sources of agricultural information					
		Male		Female		Total	
		Freq.	%	Freq.	%	Freq.	%
1st most important	Government Extension Workers	54	15.13	8	1.96	62	8.09
	NGOs	8	2.24	6	1.47	14	1.83
	Farmer Organizations, Coops, CBOs	0	0.00	1	0.24	1	0.13
	Religious groups	1	0.28	1	0.24	2	0.26
	Agri-service providers, Seed companies	11	3.08	4	0.98	15	1.96
	Family members	22	6.16	128	31.30	150	19.58
	Neighbors	91	25.49	111	27.14	202	26.37
	Radio	21	5.88	23	5.62	44	5.74
	TV	85	23.81	113	27.63	198	25.85
	Newspaper/bulletin	1	0.28	1	0.24	2	0.26
	Schools/teachers	0	0.00	1	0.24	1	0.13
	Cell phone	0	0.00	1	0.24	1	0.13
	Internet	57	15.97	11	2.69	68	8.88
	Agricultural Shows	6	1.68	0	0.00	6	0.78
		357	100.00	409	100.00	766	100.00
2nd most important	Government Extension Workers	17	4.97	5	1.31	22	3.04
	NGOs	6	1.75	11	2.89	17	2.35
	Community Meetings	1	0.29	0	0.00	1	0.14
	Farmer Organizations, Coops, CBOs	0	0.00	1	0.26	1	0.14
	Research organization/ researcher	1	0.29	0	0.00	1	0.14
	Religious groups	1	0.29	0	0.00	1	0.14
	Agri-service providers, Seed companies	7	2.05	4	1.05	11	1.52
	Family members	40	11.70	110	28.87	150	20.75
	Neighbors	84	24.56	137	35.96	221	30.57
	Radio	58	16.96	40	10.50	98	13.55
	TV	66	19.30	40	10.50	106	14.66
	Newspaper/bulletin	3	0.88	5	1.31	8	1.11
	Cell phone	0	0.00	2	0.52	2	0.28
	Internet	50	14.62	26	6.82	76	10.51
	Agricultural Shows	8	2.34	0	0.00	8	1.11
		342	100.00	381	100.00	723	100.00
3rd most important	Government Extension Workers	16	5.73	5	1.77	21	3.74
	NGOs	10	3.58	5	1.77	15	2.67
	Community Meetings	2	0.72	1	0.35	3	0.53
	Farmer Organizations, Coops, CBOs	1	0.36	0	0.00	1	0.18
	Agri-service providers, Seed companies	6	2.15	6	2.13	12	2.14
	Family members	54	19.35	65	23.05	119	21.21
	Neighbors	47	16.85	55	19.50	102	18.18
	Radio	24	8.60	29	10.28	53	9.45
	TV	41	14.70	40	14.18	81	14.44
	Newspaper/bulletin	17	6.09	5	1.77	22	3.92
	Schools/teachers	2	0.72	1	0.35	3	0.53
	Cell phone	3	1.08	1	0.35	4	0.71
	Internet	45	16.13	68	24.11	113	20.14

Desired Group	Information sources	%responses most useful sources of agricultural information					
		Male		Female		Total	
		Freq.	%	Freq.	%	Freq.	%
	Agricultural Shows	11	3.94	1	0.35	12	2.14
		279	100.00	282	100.00	561	100.00

3.6.3 Most useful sources of climate information

Table 16: Most useful sources of climate information

Desired Group	Information sources	%responses most useful sources of climate information					
		Male		Female		Total	
		Freq.	%	Freq.	%	Freq.	%
1st most important	Government Extension Workers	4	1.11	1	0.25	5	0.65
	NGOs	4	1.11	1	0.25	5	0.65
	Community Meetings	2	0.55	0	0.00	2	0.26
	Farmer Organizations, Coops, CBOs	0	0.00	1	0.25	1	0.13
	Religious groups	1	0.28	0	0.00	1	0.13
	Agri-service providers, Seed companies	1	0.28	1	0.25	2	0.26
	Family members	13	3.60	105	25.99	118	15.42
	Neighbors	29	8.03	74	18.32	103	13.46
	Radio	81	22.44	44	10.89	125	16.34
	TV	209	57.89	165	40.84	374	48.89
	Newspaper/bulletin	5	1.39	2	0.50	7	0.92
	Schools/teachers	0	0.00	1	0.25	1	0.13
	Cell phone	1	0.28	1	0.25	2	0.26
	Internet	9	2.49	8	1.98	17	2.22
	Agricultural Shows	1	0.28	0	0.00	1	0.13
	Farmer Field Days/Demonstrations	1	0.28	0	0.00	1	0.13
		361	100.00	404	100.00	765	100.00
2nd most important	Government Extension Workers	7	2.02	3	0.79	10	1.37
	NGOs	4	1.16	5	1.31	9	1.24
	Religious groups	4	1.16	1	0.26	5	0.69
	Agri-service providers, Seed companies	2	0.58	0	0.00	2	0.27
	Family members	21	6.07	99	25.92	120	16.48
	Neighbors	57	16.47	143	37.43	200	27.47
	Radio	102	29.48	59	15.45	161	22.12
	TV	96	27.75	36	9.42	132	18.13
	Newspaper/bulletin	16	4.62	10	2.62	26	3.57
	Cell phone	0	0.00	1	0.26	1	0.14
	Internet	37	10.69	25	6.54	62	8.52
		346	100.00	382	100.00	728	100.00
3rd most important	Government Extension Workers	7	2.80	6	2.11	13	2.43
	NGOs	7	2.80	1	0.35	8	1.50
	Community Meetings	0	0.00	1	0.35	1	0.19
	Farmer Organizations, Coops, CBOs	0	0.00	1	0.35	1	0.19
	Religious groups	0	0.00	1	0.35	1	0.19
	Agri-service providers, Seed companies	0	0.00	4	1.41	4	0.75
	Family members	53	21.20	91	32.04	144	26.97
	Neighbors	76	30.40	79	27.82	155	29.03

Desired Group	Information sources	%responses most useful sources of climate information					
		Male		Female		Total	
		Freq.	%	Freq.	%	Freq.	%
	Radio	18	7.20	15	5.28	33	6.18
	TV	11	4.40	21	7.39	32	5.99
	Newspaper/bulletin	15	6.00	2	0.70	17	3.18
	Schools/teachers	1	0.40	0	0.00	1	0.19
	Cell phone	3	1.20	1	0.35	4	0.75
	Internet	58	23.20	60	21.13	118	22.10
	Agricultural Shows	1	0.40	1	0.35	2	0.37
		250	100.00	284	100.00	534	100.00

3.7 Access to extension agents

The farmers were asked whether or not they met with an extension agent in the last 12 months. They would also identify the gender of the extension agent whom they met with, the type of extension activities which they engaged in during the most recent meetings, the frequency of meeting with extension agents in the past 12 months, the household member to whom extension advice was given during the most recent meeting and the organization from which the extension agent had come. They were further asked whether or not there was a fee to pay in order to access the services and how much the fee was. Lastly, the respondents also gave reasons if they did not meet with the extension agent in the past 12 months. Responses to these questions are presented in sub-sections below.

3.7.1 Gender of the extension agents who met with farmers in the last 12 months

Table 17: Extension agents who met with farmers in the last 12 months

Gender of the extension officer	Male		Female		Total	
	Freq.	%	Freq.	%	Freq.	%
Male	120	93.0	23	69.7	143	88.3
Female	2	1.6	3	9.1	5	3.1
Both male and female	7	5.4	7	21.2	14	8.6
Total	129	100	33	100	162	100

Twenty percent (20.4%) of 796 respondents (80% of men and 20% of women) had met with extension agents in the previous 12 months. The majority of men (93%) and 70% of women met with male extension agents. On the other hand, 5% of the men and 21% of women met with both male and female extension workers. Generally, very few farmers (1.6% of men and 9.1% of women) met with female extension agents. The statistics suggest that there are few female extension workers.

3.7.2 Extension activities the farmers participated in most

Table 18: Extension activities the farmers participated in most

Extension activities	Male		Female		Total	
	Freq.	%	Freq.	%	Freq.	%
One-on-one advice	52	40.3	11	33.3	63	38.9
"Training and visit"	25	19.4	8	24.2	33	20.4
Demonstration event/	7	5.4	1	3	8	4.9
Farmer organization	32	24.8	6	18.2	38	23.5
Facilitated exchange (own village)	10	7.8	3	9.1	13	8
Facilitated exchange (other than own village)	15	11.6	2	6.1	17	10.5
Community meeting	11	8.5	4	12.1	15	9.3
Other (specify in t	4	3.1	1	3	5	3.1

The extension activities that men and women most participated in were "one-on-one advice" (40% men and 33% women) as well as men's second most participated in "farmer organization meetings (own village)" was 25%. On the other hand, women's second most participated in "training and visit" was (24%).

3.7.3 Frequency of farmers' meetings with extension agents

Of the 162 respondents who met with extension agents in the previous 12 months, most met 1-2 times or 6-12 times per year (Table 19). For more frequent meetings (i.e. more than three times), more men, compared to women, had more contacts with extension workers.

Table 19: Frequency of meetings with extension agents in the past 12 months

Frequency	%responses depicting frequency of meeting with extension agents					
	Male		Female		Total	
	Freq.	%	Freq.	%	Freq.	%
Every week	5	3.9	1	3.0	6	3.7
Every 1-2 weeks	4	3.1	1	3.0	5	3.1
Every 2-4 weeks	9	7.0	3	9.1	12	7.4
6-12 times per year	28	21.7	1	3.0	29	17.9
4-6 times per year	6	4.7	0	0.0	6	3.7
3-4 times per year	13	10.1	3	9.1	16	9.9
2-3 times per year	13	10.1	3	9.1	16	9.9
1-2 times per year	44	34.1	12	36.4	56	34.6
1 time per year	7	5.4	9	27.3	16	9.9

% calculated based on total men and total women responses

Overall, both men and women had limited contact with extension personnel. However, more men had contact with extension agents and the meetings were relatively more frequent than those of women.

3.7.4 Organizations providing extension services

Table 20: Organizations providing extension services

Organizations	Male		Female		Total	
	Freq.	%	Freq.	%	Freq.	%
Government agriculture extension department	96	74.4	15	45.5	111	472.3
Agricultural research institutions	0	0	1	3	1	4.3
NGOs	32	24.8	18	54.5	50	212.8
Business	7	5.4	0	0	7	29.8
Local progressive farmers	7	5.4	2	6.1	9	38.3
Other	3	2.3	0	0	3	12.8

3.7.5 Payment for extension services

Extension services were not paid for, as reported by 100% of the respondents.

3.8 Credit and Insurance

This section solicited information about access to credit (in cash or in kind, food and other items) in the past twelve months as well as whether or not the respondents had either plot or any other type of insurance. The responses to these questions are presented in sub-sections below.

3.8.1 Access to credit in the previous 12 months

Out of 787 surveyed respondents, 534 (71% men, 65% women) attempted to obtain credit in the previous 12 months. For the households which never tried to obtain the loan, three main reasons were advanced as (1) no need for the loan (62% men and 60% women); (2) Interest rates too high (11% men, 18% women) and (3) inability to pay back the loan (14% men, 11% women). The majority of men (85%) and women (82%) thought they would have had access to a loan had they wanted to borrow in the last 12 months. This signifies that access to credit was not the limiting factor for use of credit in the study area.

3.8.2 Sources of credit

Table 21: Sources of credit

Credit Sources	Male		Female		Total	
	Freq.	%	Freq.	%	Freq.	%
Non-governmental organization	133	28.98	137	29.15	270	29.06
Group-based micro-finance or lending	30	6.54	11	2.34	41	4.41
Bank	43	9.37	39	8.30	82	8.83
Friends	50	10.89	49	10.43	99	10.66
Relatives	111	24.18	156	33.19	267	28.74
Traders or Shopkeepers	84	18.30	49	10.43	133	14.32
Landlords	2	0.44	5	1.06	7	0.75
Other	6	1.31	24	5.11	30	3.23

Non-governmental organization and Relatives were found to be the most important source of credit for the farmers. Male farmers accessed credit from mainly Non-governmental organization (29%) and female farmers accessed credit from mainly Relatives (33%). However, more men, compared to women, had access to Traders or Shopkeepers, Bank and Group-based micro-finance or lending. Other sources used by few farmers. Generally, more men than women had access to credit from the majority of the sources, notably Group-based microfinance or lending, bank and traders or shopkeepers. On the other hand, more women borrowed from Relatives and NGOs.

3.8.3 Involvement of the household members and decision making in accessing credit

Table 22: Decision making in borrowing credit

Credit variable	Members	Male		Female	
		Detail	Percentage	Detail	Percentage
Household member who attempted to borrow (responses: men 459, women 470)	1	393	85.62	345	73.40
	2	98	21.35	171	36.38
	Others	31	6.75	26	5.53
Household member that makes the decision to borrow	1	417	90.85	401	85.32
	2	143	31.15	105	22.34
	Others	37	8.06	33	7.02
Household member that made the decision about credit use (responses: men 432, women 432)	1	402	93.06	389	90.05
	2	131	30.32	160	37.04
	Others	38	8.80	30	6.94

3.8.4 Major reasons for borrowing credit

Farmers were asked about the main reasons for borrowing in the previous 12 months. Key responses are indicated in Table 23.

Table 23: The main reason that the member wanted to borrow

Main reason for borrowing credit	Male			Female			Total		
	loan applied		% successful loan	loan applied		% successful loan	loan applied		% successful loan
	freq.	%		freq.	%		freq.	%	
Agricultural or livestock production	181	39.43	91.16	139	29.57	94.96	320	34.45	92.81
Purchase of agricultural land	19	4.14	89.47	14	2.98	71.43	33	3.55	81.82
Purchase of large farm equipment	1	0.22	100.00	4	0.85	100.00	5	0.54	100.00
Purchase of farm tools	0	0.00		1	0.21	100.00	1	0.11	100.00
Purchase of irrigation equipment	0	0.00		2	0.43	100.00	2	0.22	100.00
Purchase of other farm equipment	0	0.00		1	0.21	100.00	1	0.11	100.00
To pay rent or taxes	3	0.65	66.67	1	0.21	100.00	4	0.43	75.00
To buy food/household goods	29	6.32	93.10	28	5.96	96.43	57	6.14	94.74
To pay for education	11	2.40	100.00	7	1.49	100.00	18	1.94	100.00
To pay for travel costs	0	0.00		3	0.64	100.00	3	0.32	100.00
To pay hired labor (non-agriculture)	1	0.22	100.00	3	0.64	100.00	4	0.43	100.00
To pay for agricultural labor	4	0.87	100.00	1	0.21	100.00	5	0.54	100.00
To buy livestock	8	1.74	87.50	7	1.49	100.00	15	1.61	93.33
Medical expenses	17	3.70	94.12	33	7.02	93.94	50	5.38	94.00
Other consumption	10	2.18	80.00	20	4.26	85.00	30	3.23	83.33
Purchase/Improvement/build of family dwelling	25	5.45	100.00	31	6.60	93.55	56	6.03	96.43
To pay off old loans/debts	30	6.54	93.33	41	8.72	90.24	71	7.64	91.55
For non-farm enterprise	8	1.74	100.00	25	5.32	100.00	33	3.55	100.00
To pay for a wedding	12	2.61	100.00	10	2.13	100.00	22	2.37	100.00
To buy a car	2	0.44	100.00	6	1.28	100.00	8	0.86	100.00
To buy a business vehicle	16	3.49	100.00	17	3.62	100.00	33	3.55	100.00
Other	82	17.86	100.00	76	16.17	96.05	158	17.01	98.10

% calculated based on total number of responses by gender.

3.8.5 Borrowing capacity

Table 24: Amount borrowed (cash & kind both) and credit use

Borrowing capacity	Male		Female		Total	
	Freq.	%	Freq.	%	Freq.	%
Up to 5,000 taka	120	28.37	100	22.78	220	25.52
above 5,000 & up to 10,000 taka	88	20.80	107	24.37	195	22.62
above 10,000 & up to 15,000 taka	34	8.04	48	10.93	82	9.51
above 15,000 & up to 25,000 taka	63	14.89	70	15.95	133	15.43
above 25,000 & up to 50,000 taka	72	17.02	69	15.72	141	16.36
more than 50,000 taka	46	10.87	45	10.25	91	10.56
Total	423	100.00	439	100.00	862	100.00

3.8.6 Insurance

From the study, other than 8 women respondent (1.9% of women and 1.02% of total) none of the farmers mentioned they ever purchased index-based or crop insurance for the plots they managed. Various reasons were given for not purchasing the crop insurance, the most important of which were not being aware that the insurance exists (35%) and no need for insurance (35%). About 31% did not understanding the insurance and

having lack of funds to purchase insurance (18%). Few respondents gave other reasons that included only 1.6% reported previous bad experience and 1.0% said insurance was not available. One of the respondents (0.6%) mentioned having property insurance.

3.9 Community groups

The respondents were asked about the presence of, membership in, decision-making influence over and, freedom in expressing one's opinions in the groups. Information was also solicited on group activities and benefits of the various categories of groups which were in their communities. On the other hand, those who were not members of the groups which existed in their communities were asked to give reasons why it was so.

3.9.1 Community group presence and membership

Table 25: Community group presence and membership

Group categories	Percentage of respondents who mentioned presence of community groups				Percentage of farmers who were members in the most abundant community groups			
	Male		Female		Male		Female	
	Count	% within respondent group	Count	% within respondent group	Count	% within respondent group	Count	% within respondent group
Agricultural producer's group (including marketing groups)	46	12.43	69	16.79	11	23.40	1	1.45
Livestock producer's group (including marketing groups)	6	1.62	17	4.13	1	16.67	-	-
Fisheries producer's group (including marketing groups)	56	15.14	82	19.90	2	3.57	-	-
Water users' group	40	10.81	56	13.59	1	2.50	11	19.64
Watershed management group	-	-	4	0.97	-	-	-	-
Forest users' group	1	0.27	7	1.70	1	100.00	-	-
Tree Nursery Group	-	-	6	1.46	-	-	-	-
Credit, microfinance, or merry-go-round group	347	93.53	406	98.54	45	12.97	108	26.67
Funeral/Burial or Insurance Group	58	15.68	114	27.67	10	17.24	30	26.32
Marketing and Income generating (Non-Agriculture)	11	2.97	12	2.91	6	54.55	-	-
Civic groups (improving community) or charitable group (help	25	6.76	26	6.31	11	44.00	2	7.69
Local government	25	6.76	73	17.72	2	8.00	-	-
Religious group	265	71.43	196	47.57	48	18.11	17	8.67
Other women's group (only if not already listed)	2	0.54	2	0.49	-	-	-	-
Other men's group (only if not already listed)	2	0.54	-	-	-	-	-	-
Other youth group (only if not already listed)	1	0.27	9	2.19	-	-	-	-
Other	3	0.95	1	0.28	1	33.33	-	-

3.9.3 Group activities

Table 26: Activities of the most available community groups

Group activity	Male (N=138)		Female (N=168)		Total	
	Freq.	%	Freq.	%	Freq.	%
Training in crop production	6.00	4.35	-	-	6.00	1.96
Training in water management practices	2.00	1.45	3.00	1.79	5.00	1.63
Training in income-generating schemes/entrepreneurship	1.00	0.72	3.00	1.79	4.00	1.31
Training in financial management	2.00	1.45	10.00	5.95	12.00	3.92
Supporting farmer exchange visits	1.00	0.72	-	-	1.00	0.33
Sharing agricultural information between farmers	5.00	3.62	-	-	5.00	1.63
Construction/maintenance of farm level irrigation/water harvest	4.00	2.90	5.00	2.98	9.00	2.94
Construction maintenance of community level irrigation/water	-	-	9.00	5.36	9.00	2.94
Collective labor/pooling	-	-	2.00	1.19	2.00	0.65
Microfinance/group lending/saving	52.00	37.68	122.00	72.62	174.00	56.86
Collective marketing of agricultural or livestock produce	2.00	1.45	-	-	2.00	0.65
Collective purchase/distribution of inputs (seeds/fertilizer	1.00	0.72	1.00	0.60	2.00	0.65
Collective cultivation of crops (group farming)	3.00	2.17	-	-	3.00	0.98
Individual planting of crops	4.00	2.90	1.00	0.60	5.00	1.63
Construction/maintenance of farm level soil conservation str	1.00	0.72	-	-	1.00	0.33
Construction/maintenance of community level soil conservation	1.00	0.72	-	-	1.00	0.33
Construction/maintenance of community infrastructure (roads/	1.00	0.72	-	-	1.00	0.33
Tree planting (farm-level)	-	-	2.00	1.19	2.00	0.65
Supporting Collective livelihood diversification activities	1.00	0.72	-	-	1.00	0.33
Supporting individual livelihood diversification activities	3.00	2.17	1.00	0.60	4.00	1.31
Peace Keeping Activities	5.00	3.62	-	-	5.00	1.63
Supporting community activities/social welfare (burial group	16.00	11.59	3.00	1.79	19.00	6.21
Training on fuel-efficient stoves	1.00	0.72	-	-	1.00	0.33
Religious Activities	44.00	31.88	17.00	10.12	61.00	19.93
Mobilizing resources	1.00	0.72	-	-	1.00	0.33
Other	4.00	2.90	3.00	1.79	7.00	2.29

3.9.4 Community group benefits

Table 27: Community group benefits

Community group benefits	Male (N=137)		Female (N=166)		Total (N=303)	
	Freq.	%	Freq.	%	Freq.	%
Access to good markets for produce/value addition	3	2.19	1	0.60	4	1.32
Access to inputs at low cost/input acquisition/seed or seedling	5	3.65	1	0.60	6	1.98
Access to new technologies	5	3.65	1	0.60	6	1.98
Access to financial services (credit, group savings, etc)	51	37.23	115	69.28	166	54.79
Access to important agricultural information	5	3.65	2	1.20	7	2.31
Support for social functions (funerals, weddings, etc)	16	11.68	0	-	16	5.28
Training on agricultural production/processing	5	3.65	1	0.60	6	1.98
Additional income /increased income from new activities	3	2.19	15	9.04	18	5.94
Strong social network	1	0.73	0	-	1	0.33
Greater representation in decision-making	8	5.84	3	1.81	11	3.63
Improved local environment	1	0.73	2	1.20	3	0.99

Community group benefits	Male (N=137)		Female (N=166)		Total (N=303)	
	Freq.	%	Freq.	%	Freq.	%
Improved access to irrigation/water	4	2.92	13	7.83	17	5.61
Greater productivity	1	0.73	0	-	1	0.33
Greater food production/access to produce	1	0.73	0	-	1	0.33
Enjoyment/satisfaction	2	1.46	1	0.60	3	0.99
Access to Trees and seedlings	0	-	1	0.60	1	0.33
Improved access to community infrastructure	12	8.76	0	-	12	3.96
Improved access to resources (mobilization of resources)	2	1.46	0	-	2	0.66
Access to information about agriculture or livestock	2	1.46	0	-	2	0.66
Spiritual satisfaction	36	26.28	17	10.24	53	17.49
Other	0	-	7	4.22	7	2.31

3.9.5 Reasons for not joining most available community groups

Whereas there were a number of benefits of being in community groups, some farmers opted not to join some of them or all kinds of groups. The main reasons why men and women were not joining these groups are presented in Table 28.

Table 28: Main reasons limiting membership into community groups

Reasons for not joining	Male		Female	
	Freq.	%	Freq.	%
Not interested	601	48.04	650	51.96
No time	90	89.11	11	10.89
Unable to raise entrance fees	3	10.00	27	90.00
Unable to raise reoccurring fees	8	47.06	9	52.94
Group meeting location not convenient	1	16.67	5	83.33
Family dispute/unable to join	7	8.86	72	91.14
Not allowed because of your gender	23	17.04	112	82.96
Not allowed because of other reason	12	41.38	17	58.62

3.9.6 Freedom of expression with respect to offering group suggestions

Table 29: Comfort in expressing oneself in groups

Comfort in offering group suggestions	Male		Female	
	Freq.	%	Freq.	%
No, not at all	9	18.37	40	81.63
Yes, but with a great deal of difficulty	17	70.83	7	29.17
Yes, with a little difficulty	23	82.14	5	17.86
Yes, fairly comfortable	51	45.95	60	54.05
Yes, very comfortable	39	42.86	52	57.14

3.10 Fuel and domestic water

3.10.1 Main cooking energy sources

The farmers were asked to list up to three main sources of energy for cooking in the rain and dry seasons, over the previous 12 months. The main sources for men and women varied depending on season.

Table 30: Main cooking energy sources in rain and dry seasons

Energy source	%responses depicting main energy sources in rain season				%responses depicting main energy sources in dry season			
	Male		Female		Male		Female	
	Count	% within Season	Count	% within Season	Count	% within Season	Count	% within Season
Wood from Own farm/woodlot	243	36.5	284	36.9	188	29.1	183	24.1
Wood Neighbor's farm/woodlot	44	6.6	27	3.5	29	4.5	18	2.4
Wood Community forest/land	62	9.3	75	9.7	85	13.2	68	9.0
Buy wood from market	93	14.0	73	9.5	47	7.3	49	6.5
Own charcoal	0	-	3	0.4	0	-	3	0.4
Purchased charcoal	3	0.5	3	0.4	3	0.5	3	0.4
LPG	0	-	1	0.1	2	0.3	4	0.5
Kerosene	2	0.3	0	-	2	0.3	0	-
Animal dung (own farm)	167	25.1	172	22.3	129	20.0	125	16.5
Animal dung (purchased)	14	2.1	37	4.8	7	1.1	25	3.3
Biogas (purchased)	1	0.2	0	-	1	0.2	0	-
Farm residue (stovers etc) from farm	37	5.6	94	12.2	152	23.6	278	36.6
Farm residue, purchased	0	-	1	0.1	0	-	3	0.4
Total	666	100	770	100	645	100	759	100

3.10.2 Main domestic water sources over the previous 12 months

The respondents were asked to list the main domestic water sources which they were using in the rain and dry seasons, over the previous year. They were also asked to estimate the distance from the household to those water sources and the amount of time spent collecting water per week. They also listed household members who collected water from the sources and described the quality from each source. Responses to these answers are presented in the following sub-sections.

Table 31: Water sources in the rain and dry seasons

Water sources	%responses of main domestic water sources over the previous 12 months in rainy season				%responses of main domestic water sources over the previous 12 months in dry season			
	Male		Female		Male		Female	
	Count	% within Season	Count	% within Season	Count	% within Season	Count	% within Season
River or lake	7	1.38	3	0.56	9	1.96	5	1.04
Own well or borehole (on farm)	59	11.64	73	13.64	65	14.16	80	16.56
Community borehole	111	21.89	93	17.38	131	28.54	116	24.02
Piped water	9	1.78	8	1.50	9	1.96	8	1.66
Vendor water	2	0.39	0	0.00	1	0.22	1	0.21
Rooftop water harvesting	36	7.10	40	7.48	2	0.44	7	1.45
Own pond, or micro-dam (on farm)	39	7.69	26	4.86	39	8.50	39	8.07
Shared lake, pond, or micro-dam (shared)	72	14.20	82	15.33	118	25.71	145	30.02
Irrigation canal	0	0.00	2	0.37	2	0.44	2	0.41
Other*	172	33.93	208	38.88	83	18.08	80	16.56
Total	507	100	535	100	459	100	483	100

* Two major sources mentioned in as other were rain water and others tub well

3.10.3 Distance to the main water sources

Table 32: Distance to the main water sources

Water sources	Distance (in minutes) to the main water sources in rainy season						Distance (in minutes) to the main water sources in dry season					
	Male		Female		Total		Male		Female		Total	
	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean
River or lake	7	6.86	3	7.33	10	7.00	9	8.33	5	18.40	14	11.93
Own well or borehole (on farm)	59	3.07	73	4.74	132	3.99	65	3.46	79	5.29	144	4.47
Community borehole	111	15.83	93	14.91	204	15.41	131	17.52	116	18.09	247	17.79
Piped water	9	20.67	8	50.00	17	34.47	9	19.56	8	35.88	17	27.24
Vendor water	2	16.00			2	16.00	1	60.00	1	2.00	2	31.00
Rooftop water harvesting	36	15.97	40	32.40	76	24.62	2	2.00	7	43.86	9	34.56
Own pond, or micro-dam (on farm)	39	2.36	26	3.23	65	2.71	39	3.41	39	4.05	78	3.73
Shared lake, pond, or micro-dam (shared)	72	25.47	81	27.42	153	26.50	118	26.57	144	31.99	262	29.55
Irrigation canal			2	75.00	2	75.00	2	4.00	2	45.00	4	24.50
Other	172	11.31	208	14.30	380	12.95	83	16.49	80	20.45	163	18.44
Total	507	13.12	534	16.63	1041	14.92	459	16.30	481	20.15	940	18.27

3.10.4 Water collection time

Water collection time included the amount of time spent fetching water by household members per week. This includes time taken to move from home to the water source, waiting time if there is a queue and moving back home. Table 33 shows that water collection time generally increases in the dry season. For example, the average water collection time from the community borehole in the dry season is more than four times that which is spent in the rain season. Similarly, the mean spent to collect water from the shared lake/pond/micro-dam in the dry season is close to four times the time used in the rain season. The increased time is attributed to increased distances to the sources as well as the waiting time, particularly in the case of the community bore hole. Rooftop water harvesting time (other than use of fixed water tanks) could not be estimated because of the continuous variation in the timing and duration of rain showers.

Table 33: Water collection time

Water sources	Water collection time per week in rainy season (minutes)						Water collection time per week in dry season (minutes)					
	Male		Female		Total		Male		Female		Total	
	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean
River or lake	7	63.00	3	31.67	10	53.60	9	71.56	5	128.00	14	91.71
Own well or borehole (on farm)	59	33.81	71	43.04	130	38.85	65	35.54	77	47.09	142	41.80
Community borehole	108	126.41	88	128.44	196	127.32	129	131.41	111	133.71	240	132.48

Water sources	Water collection time per week in rainy season (minutes)						Water collection time per week in dry season (minutes)					
	Male		Female		Total		Male		Female		Total	
	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean
Piped water	9	144.67	7	340.00	16	230.13	9	136.89	7	335.00	16	223.56
Vendor water	2	65.00			2	65.00	1	120.00	1	60.00	2	90.00
Rooftop water harvesting	35	45.80	40	195.33	75	125.55	2	14.50	7	260.00	9	205.44
Own pond, or micro-dam (on farm)	39	39.46	26	63.85	65	49.22	39	44.85	39	73.72	78	59.28
Shared lake, pond, or micro-dam (shared)	71	167.99	78	248.32	149	210.04	115	150.48	140	208.06	255	182.09
Irrigation canal			2	525.00	2	525.00	2	30.00	2	315.00	4	172.50
Other	171	71.64	206	74.89	377	73.42	82	99.04	78	129.49	160	113.88
Total	501	89.50	521	119.30	1022	104.69	453	107.11	467	141.47	920	124.55

3.10.4 Water quality in rain and dry seasons

Table 34: Water quality in the domestic water sources in rain season

Water quality	%responses depicting water quality in rain season				%responses depicting water quality in dry season			
	Male		Female		Male		Female	
	Count	% within Season	Count	% within Season	Count	% within Season	Count	% within Season
Very good	195	38.39	213	39.96	104	22.61	99	20.45
Good	196	38.58	197	36.96	174	37.83	221	45.66
Fair	109	21.46	98	18.39	169	36.74	135	27.89
Bad	7	1.38	22	4.13	12	2.61	26	5.37
Very Bad	1	0.20	3	0.56	1	0.22	3	0.62
Total	508	100.00	533	100.00	460	100.00	484	100.00

3.11 Climate shocks

Respondents were required to list climate shocks that had affected their households in the previous five years, mention when the shock was experienced, how wide spread it was, its primary results, immediate actions that were taken by the household and specify the household member who took the action. Respondents would also mention if the household sold any assets, specify the owner of the assets and the person(s) that were most affected in the households.

Table 35: Responses distribution of climate shocks occurs of in last 5 years

Climate shocks	%responses within respondent group					
	Male		Female		Total	
	Freq.	Percent	Freq.	Percent	Freq.	Percent
Floods	99	48.06	104	49.29	203	48.68
Droughts	14	6.80	15	7.11	29	6.95
Storms/Strong Winds	73	35.44	85	40.28	158	37.89
Erratic Rainfall	9	4.37	4	1.90	13	3.12
Cold Spells	2	0.97	0	0.00	2	0.48
Heat waves	1	0.49	1	0.47	2	0.48
Other	8	3.88	2	0.95	10	2.40
Total	206	100.00	211	100.00	417	100.00

Table 36: Severity of climate shocks occurs of in last 5 years

Climate shocks	Severity	Male		Female		Total	
		Freq.	% within respondent group	Freq.	% within respondent group	Freq.	% within respondent group
Floods	Only in my household	2	2.02	5	4.81	7	3.45
	Some households in village	20	20.20	10	9.62	30	14.78
	Most households in village	51	51.52	61	58.65	112	55.17
	Many households in the district	24	24.24	26	25.00	50	24.63
	All households in the district	2	2.02	1	0.96	3	1.48
Droughts	Only in my household	0	0.00	1	6.67	1	3.45
	Some households in village	3	21.43	2	13.33	5	17.24
	Most households in village	9	64.29	7	46.67	16	55.17
	Many households in the district	2	14.29	4	26.67	6	20.69
	All households in the district	0	0.00	1	6.67	1	3.45
Storms/Strong Winds	Some households in village	21	28.77	23	27.06	44	27.85
	Most households in village	40	54.79	50	58.82	90	56.96
	Many households in the district	9	12.33	10	11.76	19	12.03
	All households in the district	3	4.11	1	1.18	4	2.53
Erratic Rainfall	Some households in village	5	55.56	3	75.00	8	61.54
	Most households in village	4	44.44	0	0.00	4	30.77
	Many households in the district	0	0.00	1	25.00	1	7.69
Cold Spells	Some households in village	2	100.00			2	100.00
Heat waves	Some households in village	1	100.00	1	100.00	2	100.00
Other	Only in my household	2	25.00	1	50.00	3	30.00
	Some households in village	1	12.50	0	0.00	1	10.00
	Most households in village	5	62.50	1	50.00	6	60.00

3.12 Perceptions of climate change and associated risks

3.12.1 Noticeable climate changes

The majority (97%) of the total respondents (46% males and 54% females) had witnessed some noticeable changes. They listed changes as indicated in Table 37.

Table 37: Climate changes Noticed

Changes noticed	Male		Female		Total
	Freq.	Percent	Freq.	Percent	
More hot days	170	47.2%	210	51.7%	380
More cold days	137	38.1%	145	35.7%	282
Rainfall increasing	23	6.4%	45	11.1%	68
Rainfall decreasing	143	39.7%	144	35.5%	287
Rains are more erratic	187	51.9%	224	55.2%	411
Rains come earlier	2	.6%	3	.7%	5
Rains come later	40	11.1%	28	6.9%	68
Longer periods of drought	103	28.6%	35	8.6%	138
More frequent drought	47	13.1%	51	12.6%	98
More frequent flooding	24	6.7%	54	13.3%	78
More frequent heatwaves	22	6.1%	14	3.4%	36
More frequent storms	76	21.1%	127	31.3%	203
Less frequent floods	31	8.6%	39	9.6%	70
Less frequent drought	1	.3%	1	.2%	2
Less frequent heatwaves	5	1.4%	2	.5%	7
Less frequent storms	6	1.7%	10	2.5%	16
Stronger storms	80	22.2%	150	36.9%	230
increased salinity in the water	70	19.4%	55	13.5%	125
increased salinity in the soil	35	9.7%	7	1.7%	42
Increase height of sea level	3	.8%	1	.2%	4
Other	8	2.2%	6	1.5%	14

Table 38: The likelihood that certain climate changes will occur in future

Likelihood	Male		Female		Total
	Freq.	Percent	Freq.	Percent	
Not likely	6	1.7%	4	1.0%	10
Not very likely	64	17.8%	51	12.6%	115
Somewhat likely	199	55.3%	221	54.4%	420
Very Likely	91	25.3%	130	32.0%	221

Table 39: Results or impacts of such future changes

Results or impacts	Male		Female		Total
	Freq.	Percent	Freq.	Percent	
No Impacts/No Change	13	3.7%	3	.7%	16
Don't know	15	4.2%	19	4.7%	34
Reduced agricultural productivity	263	73.9%	303	74.8%	566
Water scarcity/shortage of fresh water	131	36.8%	187	46.2%	318
Decrease in livestock fodder	17	4.8%	13	3.2%	30

Results or impacts	Male		Female		Total
	Freq.	Percent	Freq.	Percent	
More soil erosion/less soil fertility	42	11.8%	9	2.2%	51
Health risks (including death)	173	48.6%	126	31.1%	299
Decrease in income	56	15.7%	90	22.2%	146
Increase poverty levels	24	6.7%	68	16.8%	92
Food insecurity	43	12.1%	103	25.4%	146
More natural disasters	65	18.3%	61	15.1%	126
Livestock deaths	18	5.1%	43	10.6%	61
Longer seasons for agriculture	2	.6%	4	1.0%	6
More water availability	0	0.0%	1	.2%	1
More pests and diseases (plant and livestock)	18	5.1%	18	4.4%	36
Less pests and diseases	1	.3%	0	0.0%	1
Change in native vegetation	1	.3%	2	.5%	3
increased salinity in the underground water	12	3.4%	6	1.5%	18
increased salinity in the soil	33	9.3%	13	3.2%	46
decrease salinity in the underground water	1	.3%	0	0.0%	1
decrease salinity in the soil	2	.6%	2	.5%	4
Other	5	1.4%	3	.7%	8

%calculated based on Total men and total women responses

3.12.2 The likelihood that certain climate changes will occur in future

More frequent/severe droughts

Table 40: More Frequent or More Severe Droughts (Impact on Community)

Likelihood in Community	Male		Female		Total
	Freq.	Percent	Freq.	Percent	
Not likely at all	63	17.1%	127	31.0%	190
Somewhat likely	149	40.4%	141	34.4%	290
Likely	114	30.9%	104	25.4%	218
Very likely	43	11.7%	38	9.3%	81
Total	369	100.0%	410	100.0%	779

Table 41: More Frequent or More Severe Droughts (Impact on HH)

Impact severity on household	Male		Female		Total
	Freq.	Percent	Freq.	Percent	
No impact	8	2.6%	49	17.4%	57
Minimal impact	90	29.4%	53	18.8%	143
Moderate impact	120	39.2%	110	39.0%	230
High impact	67	21.9%	54	19.1%	121
Severe impact	21	6.9%	16	5.7%	37
Total	306	100.0%	282	100.0%	588

More frequent/severe floods**Table 42: More Frequent or more Severe Floods (Impact on Community)**

Likelihood in Community	Male		Female		Total
	Freq.	Percent	Freq.	Percent	
Not likely at all	86	23.3%	172	42.0%	258
Somewhat likely	140	37.9%	104	25.4%	244
Likely	89	24.1%	81	19.8%	170
Very likely	54	14.6%	53	12.9%	107
Total	369	100.0%	410	100.0%	779

Table 43: More Frequent or more Severe Floods (Impact on HH)

Impact severity on household	Male		Female		Total
	Freq.	Percent	Freq.	Percent	
No impact	14	5.0%	35	14.8%	49
Minimal impact	84	29.9%	36	15.2%	120
Moderate impact	94	33.5%	57	24.1%	151
High impact	59	21.0%	67	28.3%	126
Severe impact	30	10.7%	42	17.7%	72
Total	281	100.0%	237	100.0%	518

More frequent heat waves/hotter temperatures**Table 44: More frequent Heat waves/hotter temperatures (Impact on Community)**

Likelihood in Community	Male		Female		Total
	Freq.	Percent	Freq.	Percent	
Not likely at all	63	17.1%	148	36.1%	211
Somewhat likely	143	38.8%	137	33.4%	280
Likely	118	32.0%	67	16.3%	185
Very likely	45	12.2%	58	14.1%	103
Total	369	100.0%	410	100.0%	779

Table 45: More frequent Heat waves/hotter temperatures (Impact on HH)

Impact severity on household	Male		Female		Total
	Freq.	Percent	Freq.	Percent	
No impact	14	4.6%	61	23.4%	75
Minimal impact	98	32.0%	52	19.9%	150
Moderate impact	103	33.7%	70	26.8%	173
High impact	65	21.2%	30	11.5%	95
Severe impact	26	8.5%	48	18.4%	74
Total	306	100.0%	261	100.0%	567

Shifts in rainfall patterns**Table 46: Shifts in rainfall patterns (Impact on Community)**

Likelihood in Community	Male		Female		Total
	Freq.	Percent	Freq.	Percent	
Not likely at all	49	13.3%	89	21.7%	138
Somewhat likely	139	37.7%	107	26.1%	246
Likely	135	36.6%	150	36.6%	285
Very likely	46	12.5%	64	15.6%	110
Total	369	100.0%	410	100.0%	779

Table 47: Shifts in rainfall patterns (Impact on HH)

Impact severity on household	Male		Female		Total
	Freq.	Percent	Freq.	Percent	
No impact	19	5.9%	29	9.1%	48
Minimal impact	92	28.8%	58	18.2%	150
Moderate impact	106	33.1%	131	41.2%	237
High impact	74	23.1%	63	19.8%	137
Severe impact	29	9.1%	37	11.6%	66
Total	320	100.0%	318	100.0%	638

Decline in rainfall/ less water availability**Table 48: Decline in rainfall/ less water availability (Impact on Community)**

Likelihood in Community	Male		Female		Total
	Freq.	Percent	Freq.	Percent	
Not likely at all	73	19.8%	94	22.9%	167
Somewhat likely	87	23.6%	70	17.1%	157
Likely	153	41.5%	176	42.9%	329
Very likely	56	15.2%	70	17.1%	126
Total	369	100.0%	410	100.0%	779

Table 49: Decline in rainfall/ less water availability (Impact on HH)

Impact severity on household	Male		Female		Total
	Freq.	Percent	Freq.	Percent	
No impact	3	1.0%	6	1.9%	9
Minimal impact	74	25.0%	42	13.5%	116
Moderate impact	86	29.1%	115	36.9%	201
High impact	109	36.8%	106	34.0%	215
Severe impact	24	8.1%	43	13.8%	67
Total	296	100.0%	312	100.0%	608

More Frequent Storms or Wind**Table 50: More Frequent Storms or Wind (Impact on Community)**

Likelihood in Community	Male		Female		Total
	Freq.	Percent	Freq.	Percent	
Not likely at all	60	16.3%	94	22.9%	154
Somewhat likely	118	32.0%	90	22.0%	208
Likely	112	30.4%	117	28.5%	229
Very likely	79	21.4%	109	26.6%	188
Total	369	100.0%	410	100.0%	779

Table 51: More Frequent Storms or Wind (Impact on HH)

Impact severity on household	Male		Female		Total
	Freq.	Percent	Freq.	Percent	
No impact	6	1.9%	7	2.2%	13
Minimal impact	84	27.3%	53	16.9%	137
Moderate impact	95	30.8%	89	28.3%	184
High impact	94	30.5%	98	31.2%	192
Severe impact	29	9.4%	67	21.3%	96
Total	308	100.0%	314	100.0%	622

More Frequent Cold Spells/Colder Temperatures**Table 52: More Frequent Cold Spells/Colder Temperatures (Impact on Community)**

Likelihood in Community	Male		Female		Total
	Freq.	Percent	Freq.	Percent	
Not likely at all	116	31.4%	230	56.2%	346
Somewhat likely	102	27.6%	79	19.3%	181
Likely	115	31.2%	72	17.6%	187
Very likely	36	9.8%	28	6.8%	64
Total	369	100.0%	409	100.0%	778

Table 53: More Frequent Cold Spells/Colder Temperatures (Impact on HH)

Impact severity on household	Male		Female		Total
	Freq.	Percent	Freq.	Percent	
No impact	13	5.1%	70	39.8%	83
Minimal impact	90	35.6%	32	18.2%	122
Moderate impact	95	37.5%	43	24.4%	138
High impact	41	16.2%	17	9.7%	58
Severe impact	14	5.5%	14	8.0%	28
Total	253	100.0%	176	100.0%	429

Increase height of sea level**Table 54: Increase height of sea level (Impact on Community)**

Likelihood in Community	Male		Female		Total
	Freq.	Percent	Freq.	Percent	
Not likely at all	197	53.5%	330	81.7%	527
Somewhat likely	89	24.2%	25	6.2%	114
Likely	32	8.7%	13	3.2%	45
Very likely	50	13.6%	36	8.9%	86
Total	368	100.0%	404	100.0%	772

Table 55: Increase height of sea level (Impact on HH)

Impact severity on household	Male		Female		Total
	Freq.	Percent	Freq.	Percent	
No impact	13	7.6%	5	7.2%	18
Minimal impact	65	38.2%	7	10.1%	72
Moderate impact	18	10.6%	11	15.9%	29
High impact	42	24.7%	10	14.5%	52
Severe impact	32	18.8%	36	52.2%	68
Total	170	100.0%	69	100.0%	239

Other climate changes events**Table 56: Other (Impact on Community)**

Likelihood in Community	Male		Female		Total
	Freq.	Percent	Freq.	Percent	
Not likely at all	222	97.8%	249	99.2%	471
Somewhat likely	4	1.8%	2	.8%	6
Likely	1	.4%	0	0.0%	1
Total	227	100.0%	251	100.0%	478

Table 57: Other (Impact on HH)

Impact severity on household	Male		Female		Total
	Freq.	Percent	Freq.	Percent	
No impact	1	33.3%			1
Minimal impact	2	66.7%			2
Total	3	100.0%			3

3.12.3 What possible impacts do you anticipate from these changes?**Table 58: More Frequent or More Severe Droughts**

Impacts	Male		Female		Total
	Freq.	Percent	Freq.	Percent	
No impacts/no change	2	.7%	1	.4%	3
Don't know	5	1.7%	11	4.7%	16
Reduced agricultural productivity	226	75.8%	164	69.8%	390
Water scarcity/shortage of fresh water	116	38.9%	120	51.1%	236
Decrease in livestock fodder	22	7.4%	4	1.7%	26
More soil erosion/less soil fertility	13	4.4%	7	3.0%	20
Health risks (including death)	70	23.5%	36	15.3%	106
Decrease in income	48	16.1%	45	19.1%	93
Increase poverty levels	24	8.1%	30	12.8%	54
Food insecurity	52	17.4%	47	20.0%	99
More natural disasters	3	1.0%	18	7.7%	21
Livestock deaths	27	9.1%	19	8.1%	46
Longer seasons for agriculture	0	0.0%	1	.4%	1
More water availability	0	0.0%	1	.4%	1
More pests and diseases (plant and livestock)	11	3.7%	5	2.1%	16
Change in native vegetation	0	0.0%	5	2.1%	5
increased salinity in the underground water	8	2.7%	0	0.0%	8
increased salinity in the soil	2	.7%	1	.4%	3
decrease salinity in the underground water	0	0.0%	1	.4%	1
decrease salinity in the soil	0	0.0%	1	.4%	1
Other	5	1.7%	1	.4%	6
Total	298		235		533

Table 59: More Frequent or more Severe Floods

Impacts	Male		Female		Total
	Freq.	Percent	Freq.	Percent	
No impacts/no change	3	1.1%	1	.5%	4
Don't know	5	1.9%	5	2.5%	10
Reduced agricultural productivity	112	41.6%	105	51.7%	217
Water scarcity/shortage of fresh water	75	27.9%	20	9.9%	95
Decrease in livestock fodder	33	12.3%	11	5.4%	44
More soil erosion/less soil fertility	45	16.7%	22	10.8%	67
Health risks (including death)	74	27.5%	49	24.1%	123
Decrease in income	62	23.0%	60	29.6%	122
Increase poverty levels	26	9.7%	41	20.2%	67
Food insecurity	57	21.2%	59	29.1%	116
More natural disasters	21	7.8%	44	21.7%	65

Impacts	Male		Female		Total
	Freq.	Percent	Freq.	Percent	
Livestock deaths	35	13.0%	50	24.6%	85
Longer seasons for agriculture	2	.7%	5	2.5%	7
More water availability	1	.4%	0	0.0%	1
More pests and diseases (plant and livestock)	3	1.1%	5	2.5%	8
More productive crops	0	0.0%	2	1.0%	2
Less pests and diseases	1	.4%	0	0.0%	1
Reduced fuel wood availability	2	.7%	0	0.0%	2
increased salinity in the underground water	11	4.1%	0	0.0%	11
increased salinity in the soil	15	5.6%	2	1.0%	17
decrease salinity in the soil	1	.4%	0	0.0%	1
Other	3	1.1%	2	1.0%	5
Total	269		203		472

Table 60: More frequent Heat waves/hotter temperatures

Impacts	Male		Female		Total
	Freq.	Percent	Freq.	Percent	
No impacts/no change	1	.3%	1	.5%	2
Don't know	1	.3%	5	2.5%	6
Reduced agricultural productivity	31	10.6%	39	19.4%	70
Water scarcity/shortage of fresh water	30	10.3%	89	44.3%	119
Decrease in livestock fodder	29	9.9%	11	5.5%	40
More soil erosion/less soil fertility	6	2.1%	4	2.0%	10
Health risks (including death)	228	78.1%	142	70.6%	370
Decrease in income	38	13.0%	15	7.5%	53
Increase poverty levels	13	4.5%	18	9.0%	31
Food insecurity	13	4.5%	22	10.9%	35
More natural disasters	15	5.1%	36	17.9%	51
Livestock deaths	35	12.0%	18	9.0%	53
Longer seasons for agriculture	0	0.0%	2	1.0%	2
More water availability	1	.3%	1	.5%	2
More pests and diseases (plant and livestock)	7	2.4%	5	2.5%	12
Less pests and diseases	1	.3%	0	0.0%	1
Change in native vegetation	0	0.0%	2	1.0%	2
Reduced fuel wood availability	0	0.0%	1	.5%	1
increased salinity in the underground water	4	1.4%	2	1.0%	6
increased salinity in the soil	9	3.1%	0	0.0%	9
Other	1	.3%	0	0.0%	1
Total	292		201		493

Table 61: Shifts in rainfall patterns

Impacts	Male		Female		Total
	Freq.	Percent	Freq.	Percent	
No impacts/no change	4	1.3%	3	1.0%	7
Don't know	4	1.3%	7	2.4%	11
Reduced agricultural productivity	189	62.8%	194	66.7%	383
Water scarcity/shortage of fresh water	62	20.6%	97	33.3%	159
Decrease in livestock fodder	11	3.7%	5	1.7%	16

Impacts	Male		Female		Total
	Freq.	Percent	Freq.	Percent	
More soil erosion/less soil fertility	21	7.0%	11	3.8%	32
Health risks (including death)	42	14.0%	24	8.2%	66
Decrease in income	47	15.6%	42	14.4%	89
Increase poverty levels	33	11.0%	31	10.7%	64
Food insecurity	66	21.9%	74	25.4%	140
More natural disasters	16	5.3%	55	18.9%	71
Livestock deaths	9	3.0%	8	2.7%	17
Longer seasons for agriculture	32	10.6%	8	2.7%	40
More water availability	2	.7%	1	.3%	3
More pests and diseases (plant and livestock)	11	3.7%	4	1.4%	15
Change in native vegetation	1	.3%	16	5.5%	17
Reduced fuel wood availability	1	.3%	1	.3%	2
increased salinity in the underground water	8	2.7%	4	1.4%	12
increased salinity in the soil	32	10.6%	4	1.4%	36
Other	1	.3%	0	0.0%	1
Total	301		291		592

Table 62: Decline in rainfall/ less water availability

Impacts	Male		Female		Total
	Freq.	Percent	Freq.	Percent	
No impacts/no change	2	.7%	0	0.0%	2
Don't know	3	1.0%	3	1.0%	6
Reduced agricultural productivity	168	57.3%	190	61.3%	358
Water scarcity/shortage of fresh water	180	61.4%	213	68.7%	393
Decrease in livestock fodder	5	1.7%	4	1.3%	9
More soil erosion/less soil fertility	17	5.8%	10	3.2%	27
Health risks (including death)	31	10.6%	65	21.0%	96
Decrease in income	29	9.9%	31	10.0%	60
Increase poverty levels	19	6.5%	35	11.3%	54
Food insecurity	49	16.7%	78	25.2%	127
More natural disasters	10	3.4%	38	12.3%	48
Livestock deaths	17	5.8%	6	1.9%	23
Longer seasons for agriculture	2	.7%	1	.3%	3
More pests and diseases (plant and livestock)	13	4.4%	7	2.3%	20
More productive crops	0	0.0%	1	.3%	1
Less pests and diseases	0	0.0%	2	.6%	2
Change in native vegetation	2	.7%	7	2.3%	9
Reduced fuel wood availability	1	.3%	0	0.0%	1
increased salinity in the underground water	6	2.0%	5	1.6%	11
increased salinity in the soil	34	11.6%	6	1.9%	40
decrease salinity in the underground water	0	0.0%	1	.3%	1
decrease salinity in the soil	1	.3%	1	.3%	2
Other	2	.7%	1	.3%	3
Total	293		310		603

Table 63: More Frequent Storms or Wind

Impacts	Male		Female		Total
	Freq.	Percent	Freq.	Percent	
No impacts/no change	6	2.0%	0	0.0%	6
Don't know	6	2.0%	11	3.6%	17
Reduced agricultural productivity	58	19.3%	110	35.7%	168
Water scarcity/shortage of fresh water	21	7.0%	17	5.5%	38
Decrease in livestock fodder	24	8.0%	3	1.0%	27
More soil erosion/less soil fertility	10	3.3%	8	2.6%	18
Health risks (including death)	105	35.0%	49	15.9%	154
Decrease in income	31	10.3%	44	14.3%	75
Increase poverty levels	41	13.7%	62	20.1%	103
Food insecurity	51	17.0%	75	24.4%	126
More natural disasters	106	35.3%	116	37.7%	222
Livestock deaths	80	26.7%	114	37.0%	194
More pests and diseases (plant and livestock)	5	1.7%	5	1.6%	10
Less pests and diseases	0	0.0%	1	.3%	1
Change in native vegetation	1	.3%	3	1.0%	4
Reduced fuel wood availability	2	.7%	1	.3%	3
increased salinity in the underground water	6	2.0%	3	1.0%	9
increased salinity in the soil	7	2.3%	2	.6%	9
decrease salinity in the soil	0	0.0%	1	.3%	1
Other	7	2.3%	19	6.2%	26
Total	300		308		608

Table 64: More Frequent Cold Spells/Colder Temperatures

Impacts	Male		Female		Total
	Freq.	Percent	Freq.	Percent	
No impacts/no change	4	1.7%	6	5.6%	10
Don't know	7	2.9%	6	5.6%	13
Reduced agricultural productivity	37	15.5%	13	12.1%	50
Water scarcity/shortage of fresh water	7	2.9%	2	1.9%	9
Decrease in livestock fodder	16	6.7%	0	0.0%	16
More soil erosion/less soil fertility	10	4.2%	0	0.0%	10
Health risks (including death)	161	67.4%	74	69.2%	235
Decrease in income	31	13.0%	6	5.6%	37
Increase poverty levels	11	4.6%	9	8.4%	20
Food insecurity	15	6.3%	8	7.5%	23
More natural disasters	7	2.9%	13	12.1%	20
Livestock deaths	44	18.4%	22	20.6%	66
Longer seasons for agriculture	1	.4%	0	0.0%	1
More pests and diseases (plant and livestock)	1	.4%	3	2.8%	4
More productive crops	7	2.9%	1	.9%	8
Less pests and diseases	3	1.3%	0	0.0%	3
Change in native vegetation	6	2.5%	1	.9%	7
increased salinity in the underground water	3	1.3%	0	0.0%	3
increased salinity in the soil	5	2.1%	0	0.0%	5
Other	1	.4%	0	0.0%	1
Total	239		107		346

Table 65: Increase height of sea level

Impacts	Male		Female		Total
	Freq.	Percent	Freq.	Percent	
No impacts/no change	1	.6%	0	0.0%	1
Don't know	16	10.2%	5	7.6%	21
Reduced agricultural productivity	41	26.1%	12	18.2%	53
Water scarcity/shortage of fresh water	10	6.4%	7	10.6%	17
Decrease in livestock fodder	5	3.2%	1	1.5%	6
More soil erosion/less soil fertility	5	3.2%	0	0.0%	5
Health risks (including death)	16	10.2%	1	1.5%	17
Decrease in income	8	5.1%	10	15.2%	18
Increase poverty levels	8	5.1%	19	28.8%	27
Food insecurity	6	3.8%	26	39.4%	32
More natural disasters	65	41.4%	42	63.6%	107
Livestock deaths	13	8.3%	7	10.6%	20
More pests and diseases (plant and livestock)	3	1.9%	1	1.5%	4
More productive crops	2	1.3%	0	0.0%	2
Less pests and diseases	1	.6%	0	0.0%	1
increased salinity in the underground water	26	16.6%	10	15.2%	36
increased salinity in the soil	81	51.6%	9	13.6%	90
decrease salinity in the underground water	1	.6%	5	7.6%	6
decrease salinity in the soil	0	0.0%	1	1.5%	1
Other	5	3.2%	1	1.5%	6
Total	157		66		223

3.13 Adaptation

This section sought to understand what farmers were doing or planning to do in future to cope with the observed or anticipated changes in climate. Responses were solicited on changes made (or not and why), specific individuals that made the changes in the household and changes that would be made in future. Of the total 772 respondents, 198 (25.65%; 35% males and 17% females) revealed that they had made changes. Those that had not made any changes (1) did not know what to do (2) did not see the need to make changes and (3) did not have enough money to implement changes.

Table 66: Reasons for not changing to protect household from adverse climatic variations

Reasons for not changing	Male		Female		Total
	Freq.	Percent	Freq.	Percent	
Don't see the need to make changes	66	27.7%	106	31.5%	172
Don't know what to do	131	55.0%	144	42.9%	275
Not enough money to implement changes	40	16.8%	82	24.4%	122
Not enough labor to implement changes	0	0.0%	1	.3%	1
Think that the practice (or change) might fail or not work	0	0.0%	3	.9%	3
not enough information about climate change	1	.4%	0	0.0%	1

Table 67: Changes made to protect household from adverse climatic variations

Changes	Male		Female		Total
	Freq.	Percent	Freq.	Percent	
Change crop variety	37	29.1%	4	5.8%	41
Change crop type	19	15.0%	3	4.3%	22
Change planting dates	10	7.9%	11	15.9%	21
Increase amount of land under production	16	12.6%	9	13.0%	25
Decrease amount of land under production	10	7.9%	5	7.2%	15
Change field location	5	3.9%	2	2.9%	7
Implement soil and water conservation activities	1	.8%	4	5.8%	5
Change fertilizer applications	12	9.4%	1	1.4%	13
Increase fertilizer applications	13	10.2%	0	0.0%	13
Decrease fertilizer applications	2	1.6%	0	0.0%	2
Build a water harvesting scheme on farm	2	1.6%	1	1.4%	3
Use more water for irrigation	30	23.6%	10	14.5%	40
Use water more efficiently for irrigation	5	3.9%	0	0.0%	5
Livestock adjustments:	4	3.1%	2	2.9%	6
Increase the number of livestock	7	5.5%	6	8.7%	13
Decrease the number of livestock	12	9.4%	6	8.7%	18
Diversify livestock feeds	2	1.6%	0	0.0%	2
Move animals to another site	1	.8%	0	0.0%	1
Store livestock feeds	12	9.4%	1	1.4%	13
Change from livestock to crop production	1	.8%	0	0.0%	1
Seek off farm employment	7	5.5%	12	17.4%	19
Set up non-farm business activities	20	15.7%	4	5.8%	24
Receive training in other livelihood activities	1	.8%	1	1.4%	2
Migrate to another piece of land	2	1.6%	3	4.3%	5
Members of the household migrate to an urban area	0	0.0%	3	4.3%	3
Increase planting of trees in the community	7	5.5%	0	0.0%	7
Construct earth dams or community boreholes or protect spring	1	.8%	0	0.0%	1
Start-up tree nurseries	6	4.7%	1	1.4%	7
Construct community level soil and water conservation structure	1	.8%	2	2.9%	3
Other (specify in the notes)	3	2.4%	16	23.2%	19

Table 68: Farmers plan to make any (additional) changes to protect against changes in climate over the next 5 years

Responses	Male		Female		Total
	Freq.	Percent	Freq.	Percent	
Yes	74	20.3%	87	21.4%	161
No	291	79.7%	312	76.7%	603
Do not know	0	0.0%	8	2.0%	8

Table 69: Reasons for not planning to make any (additional) changes to protect against changes in climate over the next 5 years

Reasons for not changing	Male		Female		Total
	Freq.	Percent	Freq.	Percent	
Don't see the need to make changes	64	22.1%	87	27.4%	151
Don't know what to do	142	49.1%	150	47.3%	292
Not enough money to implement changes	77	26.6%	76	24.0%	153
Not enough labor to implement changes	1	.3%	0	0.0%	1
Think that the practice (or change) might fail or not work	0	0.0%	2	.6%	2
Materials not available (water for irrigation, materials for	1	.3%	0	0.0%	1
Changes not appropriate for soil type or landscape	2	.7%	0	0.0%	2
not enough information about climate change	2	.7%	2	.6%	4

Table 70: Over next 5 years any additional changes planned by farmers to protect against changes

Future changes planned	Male		Female		Total
	Freq.	Percent	Freq.	Percent	
Change crop variety	5	7.0%	3	3.4%	8
Change crop type	6	8.5%	3	3.4%	9
Change planting dates	0	0.0%	1	1.1%	1
Increase amount of land under production	9	12.7%	14	16.1%	23
Decrease amount of land under production	5	7.0%	2	2.3%	7
Implement soil and water conservation activities	3	4.2%	2	2.3%	5
Change fertilizer applications	1	1.4%	0	0.0%	1
Increase fertilizer applications	3	4.2%	2	2.3%	5
Build a water harvesting scheme on farm	2	2.8%	0	0.0%	2
Use more water for irrigation	16	22.5%	4	4.6%	20
Use water more efficiently for irrigation	2	2.8%	1	1.1%	3
Livestock adjustments:	1	1.4%	1	1.1%	2
Increase the number of livestock	2	2.8%	5	5.7%	7
Decrease the number of livestock	4	5.6%	6	6.9%	10
Change animal breeds	1	1.4%	0	0.0%	1
Move animals to another site	1	1.4%	0	0.0%	1
Store livestock feeds	2	2.8%	1	1.1%	3
Seek off farm employment	3	4.2%	25	28.7%	28
Set up non-farm business activities	17	23.9%	10	11.5%	27
Migrate to another piece of land	1	1.4%	39	44.8%	40
Members of the household migrate to an urban area	0	0.0%	2	2.3%	2
Increase planting of trees in the community	2	2.8%	0	0.0%	2
Start-up tree nurseries	2	2.8%	0	0.0%	2
Construct community level soil and water conservation structure	1	1.4%	1	1.1%	2
Other	4	5.6%	17	19.5%	21

Table 71: Farmers would like to make changes but were not able to change

Responses	Male		Female		Total
	Freq.	Percent	Freq.	Percent	
Yes	111	30.5%	110	27.0%	221
No	249	68.4%	277	68.1%	526
Do not know	4	1.1%	20	4.9%	24

Table 72: Changes farmers would like to make but not able to

Changes	Male		Female		Total
	Freq.	Percent	Freq.	Percent	
Change crop variety	20	18.0%	5	4.5%	25
Change crop type	23	20.7%	3	2.7%	26
Change planting dates	14	12.6%	2	1.8%	16
Increase amount of land under production	47	42.3%	36	32.7%	83
Decrease amount of land under production	4	3.6%	0	0.0%	4
Change field location	6	5.4%	2	1.8%	8
Implement soil and water conservation activities	4	3.6%	2	1.8%	6
Change fertilizer applications	3	2.7%	1	.9%	4
Increase fertilizer applications	1	.9%	1	.9%	2
Decrease fertilizer applications	3	2.7%	1	.9%	4
Build a water harvesting scheme on farm	4	3.6%	1	.9%	5
Use more water for irrigation	13	11.7%	7	6.4%	20
Use water more efficiently for irrigation	1	.9%	4	3.6%	5
Livestock adjustments:	1	.9%	2	1.8%	3
Increase the number of livestock	16	14.4%	36	32.7%	52
Decrease the number of livestock	0	0.0%	2	1.8%	2
Change animal breeds	2	1.8%	0	0.0%	2
Store livestock feeds	0	0.0%	1	.9%	1
Mix crop and livestock production	0	0.0%	4	3.6%	4
Seek off farm employment	6	5.4%	6	5.5%	12
Set up non-farm business activities	8	7.2%	15	13.6%	23
Receive training in other livelihood activities	4	3.6%	5	4.5%	9
Migrate to another piece of land	1	.9%	0	0.0%	1
Members of the household migrate to an urban area	4	3.6%	1	.9%	5
Set up food storage facilities	0	0.0%	1	.9%	1
Increase planting of trees in the community	3	2.7%	8	7.3%	11
Start-up tree nurseries	4	3.6%	3	2.7%	7
Construct community level soil and water conservation structure	4	3.6%	2	1.8%	6
Other (specify in the notes)	2	1.8%	20	18.2%	22

Table 73: Reason for not able to make this change

Reason	Male		Female		Total
	Freq.	Percent	Freq.	Percent	
Don't see the need to make changes	2	1.9%	9	8.3%	11
Don't know what to do	33	31.4%	8	7.4%	41
Not enough money to implement changes	136	129.5%	134	124.1%	270
Not enough labor to implement changes	7	6.7%	7	6.5%	14
Inputs not available for purchase at the market	3	2.9%	0	0.0%	3
Think that the practice (or change) might fail or not work	0	0.0%	2	1.9%	2
Materials not available (water for irrigation, materials for	1	1.0%	1	.9%	2
Requires special tools	1	1.0%	1	.9%	2
Changes not appropriate for soil type or landscape	1	1.0%	1	.9%	2
insecurity (theft, destruction, from livestock)	0	0.0%	1	.9%	1
changes at odds with cultural practices	0	0.0%	1	.9%	1

3.14 Personal values

The respondents were asked about various personal values and they indicated whether they agreed and the extent to which they agreed or disagreed. The following sub-sections indicate responses to different values.

Table 74: Values related to agricultural innovations Respondent values regarding community/group dynamics and decision making

Personal value	Detail	Farmers' personal values (%)		Total
		Male	Female	
I actively seek out advice about agricultural practices for my farm.	Strongly Disagree	0.54	2.43	12
	Somewhat disagree	0.81	1.70	10
	Neither agree nor disagree	4.05	2.92	27
	Somewhat Agree	31.35	27.74	230
	Strongly agree	63.24	65.21	502
If spouses make household agricultural decisions together, their livelihood will improve.	Strongly Disagree	0.00	0.49	2
	Somewhat disagree	0.54	0.49	4
	Neither agree nor disagree	2.16	0.73	11
	Somewhat Agree	27.57	17.76	175
	Strongly agree	69.73	80.54	589
Everyone in the community should show respect for cultural traditions relating to agricultural practices.	Strongly Disagree	0.54	0.24	3
	Somewhat disagree	2.43	3.16	22
	Neither agree nor disagree	10.54	6.81	67
	Somewhat Agree	32.97	32.12	254
	Strongly agree	53.51	57.66	435
It is important to challenge oneself and to learn and try new things.	Strongly Disagree	0.27	0.49	3
	Somewhat disagree	5.68	1.95	29
	Neither agree nor disagree	18.11	10.22	109
	Somewhat Agree	28.38	37.23	258
	Strongly agree	47.57	50.12	382
It is important to help and assist those who do not have the resources to make	Strongly Disagree	0.54	0.24	3
	Somewhat disagree	1.36	0.73	8
	Neither agree nor disagree	8.94	4.38	51

<i>Personal value</i>	<i>Detail</i>	<i>Farmers' personal values (%)</i>		<i>Total</i>
		Male	Female	
agricultural changes themselves.	Somewhat Agree	34.15	32.60	260
	Strongly agree	55.01	62.04	458
I highly value new agricultural information, technology, and weather information.	Strongly Disagree	0.27	1.22	6
	Somewhat disagree	0.54	3.65	17
	Neither agree nor disagree	16.49	10.46	104
	Somewhat Agree	37.84	42.82	316
	Strongly agree	44.86	41.85	338
We need to protect natural resources because they are important for our livelihoods.	Strongly Disagree	0.27	0.24	2
	Somewhat disagree	0.54	0.49	4
	Neither agree nor disagree	3.51	1.22	18
	Somewhat Agree	18.65	22.14	160
	Strongly agree	77.03	75.91	597
Members of the community should work together to improve the community	Strongly Disagree	0.00	0.49	2
	Somewhat disagree	1.90	0.98	11
	Neither agree nor disagree	2.98	1.46	17
	Somewhat Agree	20.60	20.00	158
	Strongly agree	74.53	77.07	591
Traditional solutions and methods for agriculture will help to resolve all the problems we face.	Strongly Disagree	30.81	31.63	244
	Somewhat disagree	16.22	30.66	186
	Neither agree nor disagree	14.59	7.54	85
	Somewhat Agree	21.89	20.68	166
	Strongly agree	16.49	9.49	100
I am often one of the first people in my community to try new practices on my farm.	Strongly Disagree	8.99	23.84	131
	Somewhat disagree	19.89	22.63	166
	Neither agree nor disagree	27.25	18.00	174
	Somewhat Agree	28.88	26.03	213
	Strongly agree	14.99	9.49	94
Religious teachings will help us to meet any challenges we face in life, including changes in climate.	Strongly Disagree	2.97	4.87	31
	Somewhat disagree	15.41	18.98	135
	Neither agree nor disagree	23.24	38.93	246
	Somewhat Agree	35.14	24.09	229
	Strongly agree	23.24	13.14	140
When making agricultural decisions, I am most concerned about generating income.	Strongly Disagree	0.81	0.97	7
	Somewhat disagree	1.08	1.46	10
	Neither agree nor disagree	8.92	5.35	55
	Somewhat Agree	31.62	31.63	247
	Strongly agree	57.57	60.58	462
I am willing to accept agricultural advice from outside sources.	Strongly Disagree	1.62	2.68	17
	Somewhat disagree	1.62	3.41	20
	Neither agree nor disagree	9.73	5.60	59
	Somewhat Agree	35.95	43.55	312
	Strongly agree	51.08	44.77	373
I make my own agricultural decisions without worrying about what other people say.	Strongly Disagree	17.30	23.11	159
	Somewhat disagree	25.41	35.04	238
	Neither agree nor disagree	17.57	14.84	126
	Somewhat Agree	18.11	15.09	129
	Strongly agree	21.62	11.92	129
I have an active role in community-decision-making.	Strongly Disagree	7.84	10.95	74
	Somewhat disagree	9.46	25.30	139
	Neither agree nor disagree	15.95	20.19	142

<i>Personal value</i>	<i>Detail</i>	<i>Farmers' personal values (%)</i>		<i>Total</i>
		Male	Female	
	Somewhat Agree	38.38	26.52	251
	Strongly agree	28.38	17.03	175
I compete with my neighbors to see who can have a better farm.	Strongly Disagree	5.95	14.60	82
	Somewhat disagree	20.27	17.27	146
	Neither agree nor disagree	12.16	11.68	93
	Somewhat Agree	25.68	30.66	221
	Strongly agree	35.95	25.79	239
One of the problems with people today is that they challenge authority too often.	Strongly Disagree	2.70	3.16	23
	Somewhat disagree	18.38	4.38	86
	Neither agree nor disagree	20.81	26.28	185
	Somewhat Agree	31.35	41.12	285
	Strongly agree	26.76	25.06	202
It is important to have protection of one's own property rights.	Strongly Disagree	0.00	0.24	1
	Somewhat disagree	0.27	0.00	1
	Neither agree nor disagree	1.62	0.73	9
	Somewhat Agree	15.95	12.90	112
	Strongly agree	82.16	86.13	658
My community is welcoming to new agricultural ideas and practices.	Strongly Disagree	1.62	1.95	14
	Somewhat disagree	4.05	3.65	30
	Neither agree nor disagree	14.59	9.00	91
	Somewhat Agree	44.32	49.64	368
	Strongly agree	35.41	35.77	278
Co-operation with others usually works.	Strongly Disagree	1.89	1.70	14
	Somewhat disagree	5.41	0.73	23
	Neither agree nor disagree	4.86	1.22	23
	Somewhat Agree	19.19	20.19	154
	Strongly agree	68.65	76.16	567
Being a farmer is an important part of my identity.	Strongly Disagree	2.16	8.03	41
	Somewhat disagree	1.08	7.54	35
	Neither agree nor disagree	4.05	8.52	50
	Somewhat Agree	36.49	25.79	241
	Strongly agree	56.22	50.12	414
When making agricultural decisions, I am most (very) concerned about food security.	Strongly Disagree	0.81	1.70	10
	Somewhat disagree	0.27	1.46	7
	Neither agree nor disagree	6.76	4.62	44
	Somewhat Agree	34.86	29.44	250
	Strongly agree	57.30	62.77	470
I am capable of improving my life and the lives of members of my household.	Strongly Disagree	2.70	0.97	14
	Somewhat disagree	4.86	8.76	54
	Neither agree nor disagree	4.59	4.62	36
	Somewhat Agree	39.46	33.82	285
	Strongly agree	48.38	51.82	392
The land use and agricultural changes that I have implemented will help me to reduce my vulnerability to climate change.	Strongly Disagree	15.95	9.49	98
	Somewhat disagree	15.68	17.76	131
	Neither agree nor disagree	26.49	29.93	221
	Somewhat Agree	31.89	30.66	244
	Strongly agree	10.00	12.17	87
I trust members of my community to help me in times of need.	Strongly Disagree	1.36	3.89	21
	Somewhat disagree	5.98	5.84	46
	Neither agree nor disagree	4.89	4.14	35

<i>Personal value</i>	<i>Detail</i>	<i>Farmers' personal values (%)</i>		<i>Total</i>
		Male	Female	
	Somewhat Agree	30.43	33.33	249
	Strongly agree	57.34	52.80	428
The livestock changes that I have implemented will help me reduce my vulnerabilities to climate changes.	Strongly Disagree	14.09	9.76	92
	Somewhat disagree	19.51	16.10	138
	Neither agree nor disagree	25.47	31.22	222
	Somewhat Agree	29.00	34.39	248
	Strongly agree	11.92	8.54	79
I trust my family to help me in times of need.	Strongly Disagree	0.54	0.00	2
	Somewhat disagree	0.54	0.24	3
	Neither agree nor disagree	1.08	0.49	6
	Somewhat Agree	20.81	13.63	133
	Strongly agree	77.03	85.64	637
It is important to me to be able to pass my farm/land on to my children.	Strongly Disagree	42.16	33.41	293
	Somewhat disagree	24.59	20.00	173
	Neither agree nor disagree	4.86	5.12	39
	Somewhat Agree	11.08	16.83	110
	Strongly agree	17.30	24.63	165
I feel a very strong connection to the land that I farm.	Strongly Disagree	0.27	1.22	6
	Somewhat disagree	0.27	3.41	15
	Neither agree nor disagree	3.78	5.60	37
	Somewhat Agree	30.81	28.22	230
	Strongly agree	64.86	61.56	493
Men and women should have equal roles in agricultural decision-making	Strongly Disagree	1.35	0.73	8
	Somewhat disagree	2.70	0.73	13
	Neither agree nor disagree	2.97	1.46	17
	Somewhat Agree	29.19	19.22	187
	Strongly agree	63.78	77.86	556