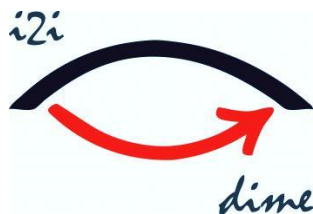# Nepal Agriculture & Food Security Project (AFSP) Impact Evaluation

Baseline Survey Report

Development Impact Evaluation (DIME)

Global Agriculture & Food Security Program (GAFSP)

August 2014

Contents

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Acronyms and Abbreviations

AFSP	Agriculture and Food Security Project
BCC	Behavior Change Communication
FAOFG	Farmer Group
FNSE	Food and Nutrition Status Enhancement (component of AFSP)
FFS	Farmer Field Schools
GAFSP	Global Agriculture and Food Security Program
GoN	Government of Nepal
ICC	Intra-Cluster Correlation
IE	Impact Evaluation
IYCF	Infant and Young Child Feeding
KISAN	Knowledge-based Integrated Sustainable Agriculture and Nutrition (USAID)
MDES	Minimum Detectable Effect Size
MoAD	Ministry of Agricultural Development
MoHP	Ministry of Health and Population
NLSS	National Living Standards Survey
PMU	Project Management Unit
TDA	Technology Dissemination and Adoption (component of AFSP)

List of Appendices

1. Introduction

This report presents the main findings of the baseline household survey for the impact evaluation of the Nepal Agriculture and Food Security Project (AFSP). The baseline survey took place from July to October 2013. The baseline report provides descriptive statistics on the following topics: socioeconomic profile of the households, access to agricultural extension services, agricultural production and commercialization, household income and expenditures, access to and use of rural financial services, and food security, including women's and children's dietary diversity.

2. Background

2.1. Agriculture and Food Security Project

The Nepal Agriculture and Food Security Project (AFSP) aims to improve the livelihood of poor farmers by increasing agricultural output and improving nutritional practices. AFSP is funded by the Global Agriculture and Food Security Project (GAFSP), supervised by the World Bank, and implemented by the Ministries of Agricultural Development (MoAD) and Health and Population (MoHP). AFSP includes 19 districts[1] of the mid- and far-western development region of Nepal. It intends to benefit 162,000 people living in hill and mountain agro-climactic zones.

AFSP consists of four components:

1. Technology Development and Adaptation
2. Technology Dissemination and Adoption (TDA)
3. Food and Nutrition Status Enhancement (FNSE)
4. Project Management

The Impact Evaluation of AFSP will concentrate on components 2 and 3. Component 2, TDA, aims to introduce farmers to new production and management methods for both crops and livestock in order to improve their yields and income using a Farmer Field Schools (FFS) approach. Component 3, FNSE, aims to improve feeding practices of young children, primarily through Behavior Change Communication (BCC).

2.2. Impact evaluation (IE) of AFSP

The World Bank's Development Impact Evaluation (DIME) unit is collaborating with GAFSP and the AFSP team on a rigorous impact evaluation of the AFSP. The AFSP Impact Evaluation (IE) will measure the effects of AFSP on technology adoption and nutrition. The IE methodology is a randomized phase-in of project components at the level of the village development committee (VDC).[2] Comparing outcomes in

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[1] The 19 districts are: Darchula, Baitadi, Dadeldhuda, Humla, Jumla, Mugu, Dolpa, Kalikot, Bajhang, Bajura, Jajarkot, Achham, Doti, Dailekh, Surkhet, Rukum, Salyan, Rolpa, and Piuthan

[2] Nepal is administratively organized into units of decreasing size: regions, districts, sub-districts (illakas), municipalities (VDCs), and wards. Nepal has 75 districts, each of which is divided into a number of VDCs, the number depending on the population size. There are 3,914 VDCs nationwide and every VDC has 9 wards.

VDCs that benefit from AFSP in the first phase to villages who have not yet benefited from AFSP will allow us to identify the causal impact of AFSP at the VDC level. A sample of VDCs outside of the project area will also be used as additional controls. A detailed explanation of the AFSP IE design is available in the IE Concept Note, available online.[3]

This report presents baseline statistics from only the AFSP selected VDCs, except for the data in the balance test section.

3. Results Framework

Table 1 presents the baseline values for the results framework indicators of AFSP.

Most of the results framework indicators align with results from other surveys in Nepal, with a few notable exceptions. Our survey results are significantly lower for potato yields (4.8 tons/ha compared to benchmark of 13 tons/ha[4]), laying hen productivity (20 compared to 90 eggs per hen[5]), and the minimum dietary diversity level for children (47% compared to 77%[6]).

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[3] Detailed information on the impact evaluation of AFSP available in the AFSP IE concept note online, as well as attached as Appendix 2. http://siteresources.worldbank.org/INTDEVIMPEVAINI/Resources/3998199-1372170088287/AFSP_IE_CN_Final.pdf

[4] Government of Nepal. Agri-Business Promotion and Statistics Division, Statistics Section, Ministry of Agricultural Development, *Statistical Information on Nepalese Agriculture*, Singha Durbar, Kathmandu, Nepal: , 2011-12.

[5] Government of Nepal. Agri-Business Promotion and Statistics Division, Statistics Section, Ministry of Agricultural Development, *Statistical Information on Nepalese Agriculture*, Singha Durbar, Kathmandu, Nepal: , 2011-12.

[6] Government of Nepal. Population Division, Ministry of Health and Population. *Nepal Demographic and Health Survey.* Kathmandu, Nepal: , 2012.

Table 1. Result framework indictors of AFSP

		N	Mean	SD
Increased productivity	*Crops - average HH yield (tons/ha)*			
	Wheat	1246	1.4	1.0
	Summer maize	574	1.9	1.8
	Main paddy	1088	2.9	2.2
	Potato	344	4.8	5.3
	Livestock			
	Eggs *(numbers/hen)*	626	21.3	28.9
	Cow milk *(liters/cow)*	688	263.4	269.7
	Buffalo milk *(liters/buffalo)*	477	640.4	590.6

		Area (ha)	Share replaced
	Seed replacement rate		
	Wheat	312.8	6.4%
	Summer maize	177.8	13.4%
	Main paddy	189.4	9.3%
	Potato	22.3	35.1%

		N	Mean
Increased dietary intake	*Pregnant & nursing women*		
	Women consumed animal proteins	1452	56.5%
	Women consumed vegetables & fruits	1452	57.2%
	Children under 24 months		
	Minimum dietary diversity (6-23m)	896	47.0%
	Minimum meal frequency (6-23m)	896	86.4%
	Breast milk or milk products (6-23m)	896	99.8%
	With 3 IYCF practices (milk, diversity, frequency) (6-23m)	896	41.9%

Note: Productivity variables are winsorized at the 1% upper tail. Yield calculations only include monocropped plots, while seed replacement rate calculations include intercropped plots.

4. Baseline household survey

4.1. Data collection

New Era Pvt, Ltd conducted the AFSP baseline survey from July to October 2013. The survey used a paper questionnaire with concurrent data entry. The questionnaire focused on agricultural production

and food security, and contained modules on housing, labor, education, health, income and expenditures, assets, and rural finance. The full questionnaire is available online.[7]

4.2. Sample

The AFSP project includes ten VDCs in each of the nineteen project districts. In most districts, eight of the ten AFSP VDCs were selected for the impact evaluation, along with four VDCs per district not receiving AFSP, which will serve as long-term controls. The AFSP Baseline Survey was conducted in 228 VDCs.

Before conducting the baseline survey, the survey firm completed a household census in each VDC to identify households that meet eligibility criteria for AFSP interventions. The census included a list of questions on household composition, land and livestock ownership, and interest in participating in agricultural projects. The census data was used to establish eligibility for AFSP interventions, and thus compose the sample frame. For each VDC, we drew a sample of 10 households. The selection gave preference to households with young children, as they are most likely to benefit from both the nutrition and the agricultural interventions of AFSP. The household census and sampling were coordinated closely with the local officials responsible for forming AFSP groups to ensure that the sampled households were very likely to end up joining the groups.

Table 2 shows the distribution of the sample across districts, separated into external control, AFSP treatment and control groups.

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[7] http://siteresources.worldbank.org/INTDEVIMPEVAINI/Resources/3998199-1372170088287/AFSP_Baseline.xlsx

Table 2. AFSP Baseline Sample - District

District	Treatment Status			
	External control	AFSP Treatment	AFSP Control	Total
Pyuthan	40	60	40	140
Rolpa	40	40	40	120
Rukum	40	40	40	120
Salyan	40	40	40	120
Surkhet	40	40	40	120
Dailekh	40	40	40	120
Jajarkot	0	60	40	100
Dolpa	40	40	40	120
Jumla	40	40	40	120
Kalikot	40	60	40	140
Mugu	40	40	40	120
Humla	40	40	40	120
Bajura	40	40	40	120
Bajhang	40	40	40	120
Achham	40	40	40	120
Doti	40	40	40	120
Dadeldhura	0	60	40	100
Baitadi	40	40	40	120
Darchula	40	40	40	120
Total	680	840	760	2280

Figure 1. Household composition by agro-climactic zones[8]

Hill Districts 59%
Mountain Districts 41%

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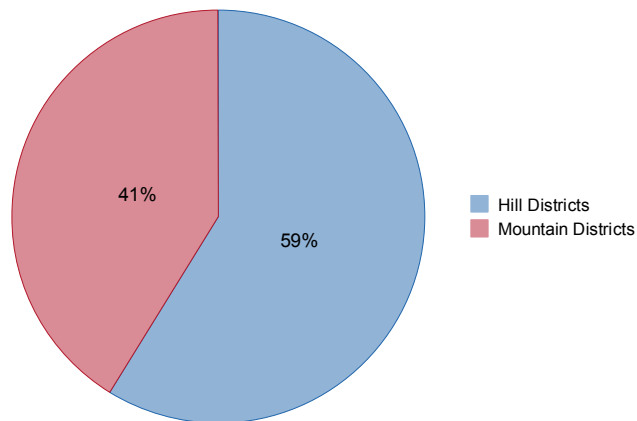
[8] Although districts can contain varied geography, we classify the districts as following: Hill districts are Pyuthan, Rolpa, Rukum, Salyan, Surkhet, Dailekh, Jajarkot, Achham, Doti, Dadeldhura and Baitadi. Mountain districts are Dolpa, Jumla, Kalikot, Mugu, Humla, Bajura, Bajhang and Darchula.

5. Validity of Control Groups

The IE contains four "treatment" VDCs in each district, and eight control VDCs. There are two types of control VDCs. Four are VDCs that have been selected to receive AFSP in the second phase of implementation, and can therefore serve as short-term controls.[9] We refer to these VDCs as "AFSP Controls". Four will not receive AFSP. These VDCs will serve as long-term controls.

Table 3 compares values of key indicators in both treatment and control VDCs. Similarity across the groups ("balance"), is evidence that the controls are a valid counterfactual. The balance tests presented in Table 3 show that there are few differences in household characteristics, agricultural production, livestock, and women's dietary diversity between the AFSP treatment VDCs and either group of control VDCs. However, there is imbalance on some of the child nutrition indicators between AFSP treatment and the control groups. To correct for these differences, we will add baseline values of these indicators as controls in the IE analysis.

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[9] The AFSP VDCs were paired on the basis of geography, technical feasibility, food security and DAG score. From each paring, one VDC was randomly selected to be an "early starter" in 2013, leaving the other to be a late-starter in 2015, with a total of 76 AFSP Treatment VDCs and 76 AFSP Control.

Table 3. Balance tests of data from treatment, control and external control VDCs

	External Cotnrol			AFSP Treatment			AFSP Control			Total			Treatment vs. Control Conditional Difference	Treatment vs. External Conditional Difference
	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD		
Household Characteristics														
Number of male HH head	680	0.82	0.39	840	0.81	0.39	760	0.78	0.42	2280	0.80	0.40	0.03	0.00
Number of HH members	680	6.52	2.41	840	6.38	2.36	760	6.42	2.33	2280	6.43	2.36	-0.04	-0.14
HH Head with primary education	680	0.40	0.49	840	0.43	0.50	760	0.42	0.49	2280	0.42	0.49	0.00	0.03
Pregnant & nursing women														
Women consumed animal proteins	627	0.55	0.50	766	0.56	0.50	686	0.57	0.50	2079	0.56	0.50	-0.018	0.01
Women consumed vegetables & fruits	627	0.57	0.50	766	0.57	0.50	686	0.58	0.49	2079	0.57	0.50	-0.021	-0.01
Children under 24 months														
Early initiation of breastfeeding (<24m)	516	0.55	0.50	634	0.60	0.49	574	0.58	0.49	1724	0.58	0.49	0.02	0.07**
Exclusively breastfed (<6m)	136	0.68	0.47	175	0.70	0.46	137	0.72	0.45	448	0.70	0.46	-0.05	0.05
Continued breastfeeding at 1 year(12-15m)	81	0.99	0.11	104	1.00	0.00	95	1.00	0.00	280	1.00	0.06		0.02
Introduction of solid or soft foods (6-8m)	73	0.86	0.35	88	0.88	0.33	88	0.81	0.40	249	0.85	0.36	0.08	0.03
Minimum dietary diversity (6-23m)	380	0.49	0.50	459	0.44	0.50	437	0.51	0.50	1276	0.48	0.50	-0.07*	-0.04
Minimum meal frequency (6-23m)	380	0.86	0.35	459	0.83	0.37	437	0.90	0.31	1276	0.86	0.35	-0.06***	-0.01
Minimum acceptable diet-breastfed (6-23m)	380	0.44	0.50	459	0.37	0.48	437	0.47	0.50	1276	0.42	0.49	-0.10***	-0.06
Consumption of iron-rich foods(6-23m)	380	0.07	0.26	459	0.08	0.28	437	0.10	0.30	1276	0.09	0.28	-0.02	0.01
Children ever breastfed(<24m)	516	1.00	0.00	634	1.00	0.04	574	1.00	0.00	1724	1.00	0.02	0.00	0.00
Children continued breastfed at 2 year (20-23m)	92	0.99	0.10	83	0.94	0.24	102	0.96	0.20	277	0.96	0.19	-0.04	-0.05*
Children age-appropriate breastfeeding (<24m)	516	0.73	0.45	634	0.72	0.45	574	0.75	0.43	1724	0.73	0.44	-0.03	-0.01
Children predominant breastfeeding (<6m)	136	0.78	0.42	175	0.77	0.42	137	0.80	0.40	448	0.78	0.41	-0.05	0.02
Children bottlefeeding (<24m)	516	0.05	0.21	634	0.04	0.20	574	0.03	0.17	1724	0.04	0.19	0.01	-0.02
Milk feeding frequency for non-breastfed children (6-23m)	380	0.00	0.00	459	0.00	0.00	437	0.00	0.00	1276	0.00	0.00		
Breastmilk milk or milk products (6-23m)	380	1.00	0.05	459	1.00	0.05	437	1.00	0.05	1276	1.00	0.05	0.00	0.00
Children having 3 IYCF practices	380	0.44	0.50	459	0.37	0.48	437	0.47	0.50	1276	0.42	0.49	-0.10***	-0.06
Number of Observations	680			840			760			2280				

Note: Productivity variables are winsorized at the 1% upper tail.

The balance test is constructed from an unweighted OLS regression estimating β1 from the equation var = α+β1(tmt)+β2X+ε, where tmt is a dummy for treatment status, and X is a matrix of district fixed effects. The standard errors are robust and clustered at the village level. */**/*** means that that B1 is significantly different from zero at the 1/5/10% level.

6. Household profile

6.1. Household composition

The average household has slightly more than six members. 76% of the households have at least one mother with at least one child less than 2 years old. On average, 60% of household heads have received some formal education.

Figure 2. Household composition by household head gender
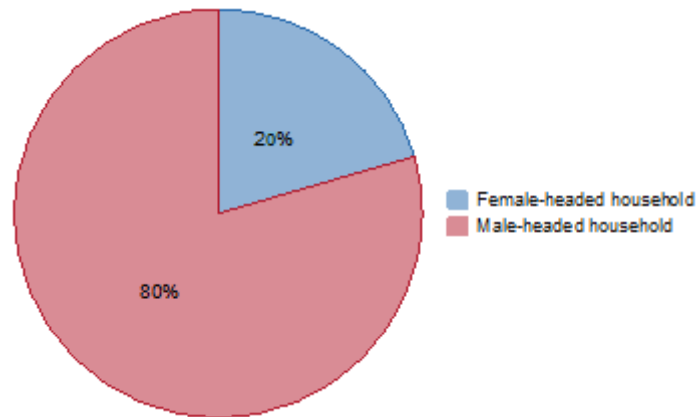
Figure 3. Household head education
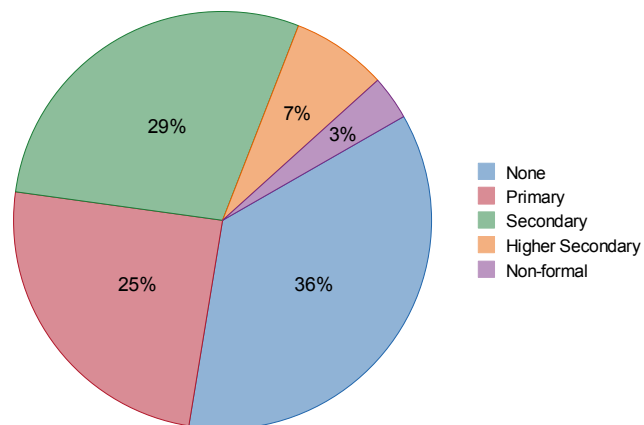
Compared to the male-headed households, female-headed households have much lower levels of education. Female-headed household heads are twice as likely to have received no schooling, and around half are as likely to complete primary or secondary education as compared to male household heads.

Figure 4. Household head education by household head gender

Female-headed household	Male-headed household

Female-headed household: None 59%, Primary 17%, Secondary 15%, Higher Secondary 2%, Non-formal 7%

Male-headed household: None 30%, Primary 27%, Secondary 32%, Higher Secondary 9%, Non-formal 2%

Legend: None, Primary, Secondary, Higher Secondary, Non-formal
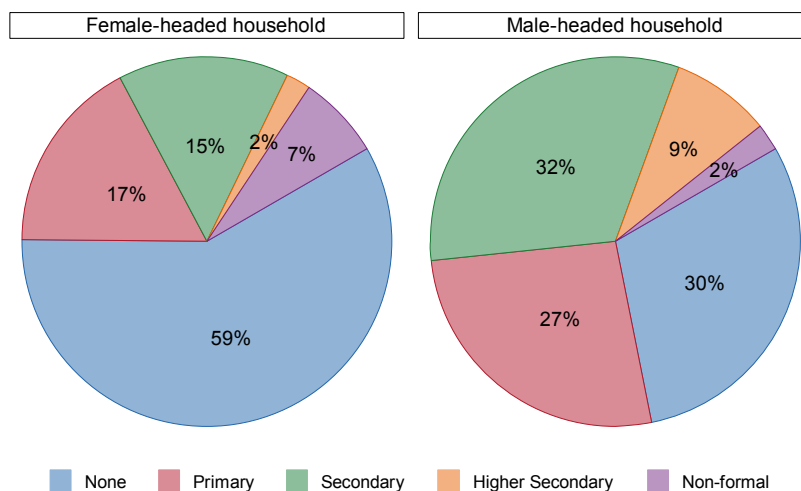
Figure 5. Household head education by region

Hill	Mountain

Hill: None 33%, Primary 27%, Secondary 29%, Higher Secondary 6%, Non-formal 4%

Mountain: None 40%, Primary 21%, Secondary 28%, Higher Secondary 9%, Non-formal 2%

Legend: None, Primary, Secondary, Higher Secondary, Non-formal
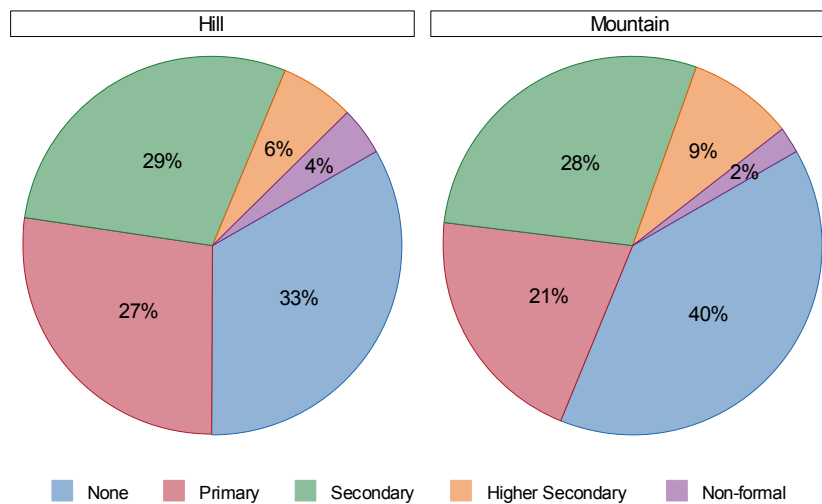
Nearly all household heads work primarily in the agricultural or forest sector. Female household heads rarely participate in non-agricultural occupations, besides being a housewife.

Figure 6. Household head primary occupation by household head gender
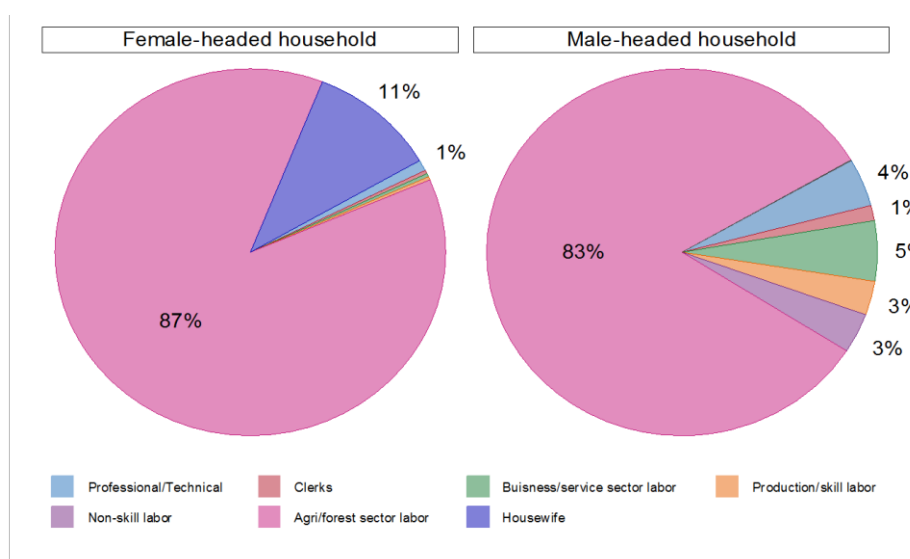
6.2. Out-migration[10] of young male workers

One of three households in the sample report at least one male household member working outside of their own VDC. The typical migrant is a male in their mid-twenties, who has worked outside of the home for at least half a year. Most male migrants work outside Nepal, while the female migrants tend to work outside of the village but in the same district.

Table 4. Percentage of household with at least one out-migrant member

	Female-headed HH	Male-headed HH	Total sample
Percentage of HH with out-migant members	60.1%	28.2%	35.8%
N	328	1272	1600

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[10] Out-migrants are defined as people working outside of their home VDC (in another VDC, another district, or out of the country).

Table 5. Destination of Migration, for households with at least one migrant[11]

	Outside VDC	Outside Districts	Outside Nepal	N
Female-headed HH	7%	14%	83%	197
Male-headed HH	21%	26%	62%	359
Sample	16%	22%	70%	556

6.3. Characteristics of the dwelling

More than 98% of the households own their own dwelling, 90% of which are built from stone and mud. Table 6 shows the types of roofing materials used. The majority of households have roofs made of ceramic tiles.

Table 6. Housing characteristics - roofing

	Hill Districts	Mountain Districts	Total Sample
Thatch/palm leaf	23.5%	6.1%	16.3%
Wood planks	0.0%	6.1%	2.5%
Galvanized sheet	14.5%	4.2%	10.3%
Ceramic tiles	59.3%	36.8%	50.0%
Cement	1.3%	1.5%	1.4%
Others	1.5%	45.3%	19.6%
N	940	660	1,600

Approximately two-thirds of the households report using public taps or standpipes as the primary source of drinking water, as shown in Table 7. A quarter of the households in the hill areas have pipes to their yard or plot, compared to only 11% of mountain households. Approximately 10% of households rely on unprotected water sources; this is more common in hill than mountain areas.

46% of the households report having toilet facilities that flush to septic tanks. Nearly one- fifth of the households do not have any kinds of toilet facilities.

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[11] Percentage is percentage of households with at least one migrant in the category. The percentages can add up to greater than 100 since some households have multiple migrants.

Table 7. Facilities by region

	Hill Districts	Mountain Districts	Total Sample
Primary source of drinking water			
Piped into dwelling	0.1%	0.3%	0.2%
Piped to yard/plot	25.7%	10.9%	19.6%
Public tap/stand pipe	57.7%	73.6%	64.3%
Protected well	0.3%	0.0%	0.2%
Unprotected well	0.5%	0.3%	0.4%
Protected spring	0.0%	0.2%	0.1%
Unprotected spring	1.6%	1.7%	1.6%
Surface water	8.9%	4.1%	6.9%
Stone tap/dhana	4.8%	8.9%	6.5%
Other	0.3%	0.0%	0.2%
Toilet facility			
Flush to piped sewer system	0.2%	0.0%	0.1%
Flush to septic tank	46.1%	45.2%	45.7%
Flush to pit latrine	5.2%	3.8%	4.6%
Ventilated improved pit latrine	9.3%	5.8%	7.8%
Pit latrine with slab	16.0%	23.9%	19.3%
Pit latrine without slab/Open pit	3.7%	2.9%	3.4%
No facility/bush/field	18.8%	17.7%	18.4%
Others	0.7%	0.8%	0.8%
N	940	660	1,600

Male-headed households are more likely to use public taps or stand pipes for drinking water than female-headed households. More female-headed households reported to use unprotected spring, surface water or stone tap (dhana) for drinking water. Toilet facilities are similar for male and female-headed households.

Table 8. Facilities by household head gender

	Female-headed HH	Male-headed HH	Total Sample
Primary source of drinking water			
Piped into dwelling	0.0%	0.2%	0.2%
Piped to yard/plot	22.0%	19.0%	19.6%
Public tap/stand pipe	57.9%	65.9%	64.3%
Protected well	0.3%	0.2%	0.2%
Unprotected well	0.0%	0.6%	0.4%
Protected spring	0.0%	0.1%	0.1%
Unprotected spring	2.7%	1.3%	1.6%
Surface water	9.1%	6.4%	6.9%
Stone tap/dhana	7.9%	6.1%	6.5%
Other (specify)	0.0%	0.2%	0.2%
Toilet facility			
Flush to piped sewer system	0.3%	0.1%	0.1%
Flush to septic tank	46.0%	45.6%	45.7%
Flush to pit latrine	6.1%	4.2%	4.6%
Ventilated improved pit latrine	7.6%	7.9%	7.8%
Pit latrine with slab	16.5%	20.0%	19.3%
Pit latrine without slab/Open pit	5.2%	2.9%	3.4%
No facility/bush/field	18.0%	18.5%	18.4%
Others	0.3%	0.9%	0.8%
N	328	1272	1,600

Nearly three quarters of households have access to electricity, either through the electric grid (37%) or through solar power (37%). Households without access to electricity primarily rely on battery-operated torches. Rates of electrification are similar between hill and mountain regions. Female-headed households have slightly lower access to electricity, and are more likely to use biogas, kerosene and battery-operated lighting.

Table 9. Energy source of lighting, by region

	Hill Districts	Mountain Districts	Total Sample
Electricity (Grid)	36.9%	37.0%	36.9%
Biogas	0.6%	0.0%	0.4%
Solar Electricity	39.1%	34.8%	37.4%
Kerosene	2.6%	1.1%	1.9%
Candles	0.2%	0.0%	0.1%
Chargeable/ battery-operated torch	19.3%	17.9%	18.7%
Others	1.3%	9.2%	4.6%
N	940	660	1,600

Table 10. Energy source of lighting, by household head gender

	Female-headed HH	Male-headed HH	Total Sample
Electricity (Grid)	33.8%	37.7%	36.9%
Biogas	0.9%	0.2%	0.4%
Solar Electricity	36.0%	37.7%	37.4%
Kerosene	4.0%	1.4%	1.9%
Candles	0.3%	0.1%	0.1%
Chargeable/ battery-operated torch	21.3%	18.0%	18.7%
Others	3.7%	4.8%	4.6%
N	328	1,272	1,600

7. Use of agricultural technologies & access to agriculture extension

7.1. Use of agricultural technologies

The questionnaire included information on usage of a number of improved agricultural technologies that will be promoted by AFSP. The most commonly practiced technology at baseline is storing seed in metal bins/super bags, already adopted by half of the households. A quarter of the households use row cropping, direct seeding of rice or surface seeding of wheat. The least commonly practiced technologies at baseline are relay cropping, green manure, and the use of biopesticides, all adopted by less than 10% of the households.

Figure 7. Household adoption of key agricultural technologies
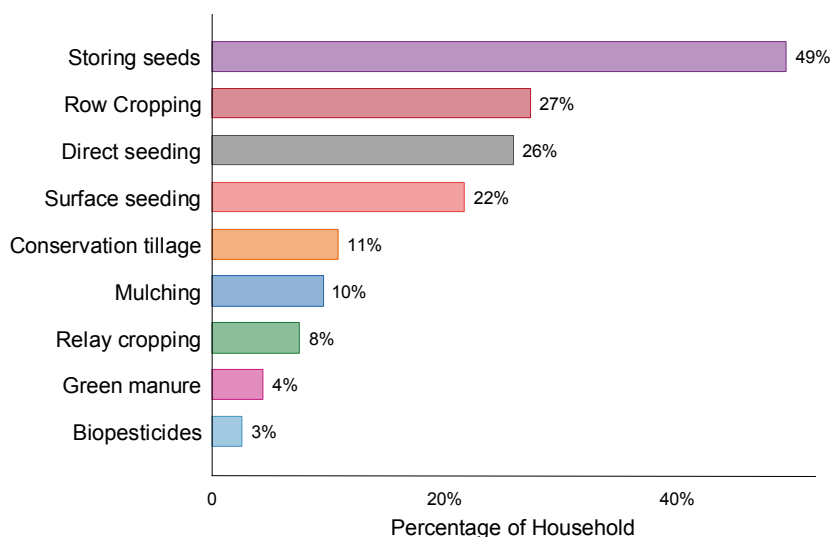
Female and male-headed households have similar rates of adoption of agricultural technologies.

Table 11. Household adoption rate on agricultural technology, by household head gender and region

	Female-headed HH	Male-headed HH	Hill HH	Mountain HH	N
Mulching	8.2%	9.9%	9.1%	10.2%	1600
Row cropping	29.0%	27.0%	30.9%	22.4%	1600
Relay cropping	7.3%	7.6%	7.8%	7.3%	1600
Conservation tillage	10.7%	10.9%	8.6%	14.1%	1600
Storing seeds	48.5%	49.7%	46.9%	53.0%	1600
Green manure	3.7%	4.6%	6.3%	1.8%	1600
Biopesticides	1.5%	2.9%	2.0%	3.5%	1600
Direct seeding*	26.3%	25.9%	27.2%	24.2%	1210
Surface seeding*	19.1%	22.5%	19.0%	26.2%	1414
N	328	1272	940	660	1600

*Adoption of direct and surface seeding only applies for households growing rice and/or wheat

7.2. Interaction with agriculture extension

In general, the households in the sample have limited usage of extension services. Less than 10% of households were visited by either a government or NGO extension worker in the past year. This pattern is consistent across both agro-climactic zones.

Table 12. Household access to agriculture extension, by region

	Hill	Mountain	Total Sample
Government worker	5.4%	5.0%	5.3%
NGO worker	2.2%	3.3%	2.7%
Both	0.5%	0.6%	0.6%
Neither	91.8%	91.1%	91.5%
N	940	660	1600

Male-headed households are nearly twice as likely to have been visited by a government extension worker.

Table 13. Household access to agriculture extension services, by household head gender

	Female-headed HH	Male-headed HH	Total Sample
Government worker	3.1%	5.8%	5.3%
NGO worker	2.1%	2.8%	2.7%
Both	0.0%	0.7%	0.6%
Neither	94.8%	90.6%	91.5%
N	328	1272	1600

8. Farmer organizations

Many households report being part of farmer groups, though few are part of cooperatives. The mountain areas have higher levels of farmer organization compared to the hill areas. Female-headed households are somewhat more likely to belong to farmer groups than their male counterparts.

Figure 8. Household member of a farmer group or cooperative, by region

Hill	Mountain

Farmer Group   Cooperative   Both   None
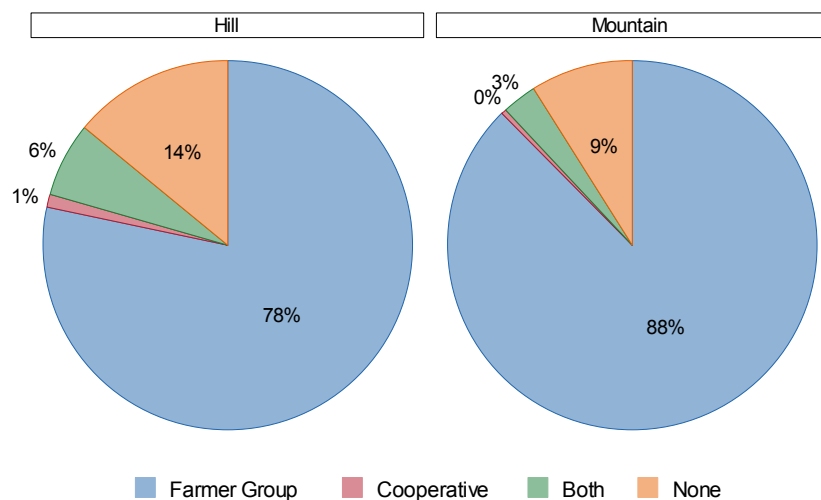
Figure 9. Household member of a farmer group or cooperative, by household head gender

Female-headed household	Male-headed household

Farmer Group   Cooperative   Both   None
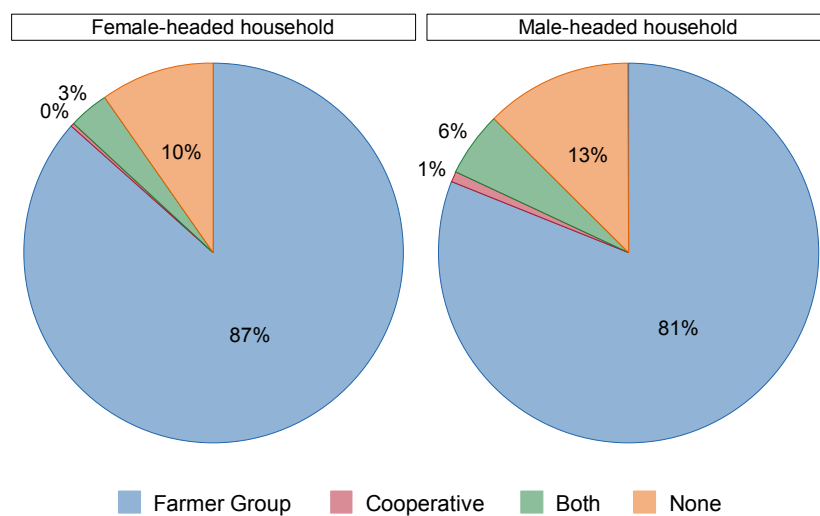
9. Agriculture landholdings

Households in the sample have an average of .32 hectares of agricultural land, divided into more than 3 plots. Plots are quite small, averaging one-tenth of a hectare. Households typically cultivate more than six crops over the course of the year.

Households in the mountains have more fragmented land holdings than those in the hills. Total landholdings in the mountains are smaller, but the average number of plots per household is larger.

Households in the mountains also tend to grow a higher variety of crops. More than 90% of the households own their plots, with about 3% sharecropping.

Table 14. Agriculture and crop summary, by region

	Hill		Mountain		Total	
	Mean	SD	Mean	SD	Mean	SD
HH NO. of plots	3.17	1.67	4.24	1.78	3.61	1.80
HH average plot size (HA)	0.13	0.10	0.08	0.06	0.11	0.09
HH agricultural landholdings	0.35	0.21	0.29	0.19	0.32	0.21
HH No. of Crops planted (one year)	5.70	3.54	7.05	4.2	6.26	3.88
N	940		660		1600	

Female-headed households have fewer and smaller plots compared to male-headed households.

Table 15. Agriculture and crop summary, household head gender

	Female-headed HH		Male-headed HH		Total	
	Mean	SD	Mean	SD	Mean	SD
HH NO. of plots	3.21	1.76	3.71	1.8	3.61	1.80
HH average plot size (HA)	0.10	0.08	0.11	0.09	0.11	0.09
HH agricultural landholdings	0.28	0.19	0.33	0.21	0.32	0.21
HH No. of Crops planted (one year)	5.65	3.62	6.42	3.93	6.26	3.88
N	328		1272		1600	

In 96% of the households, primary decisions regarding all plots were made by a single gender. In female-headed households, the primary decision-maker was always female. In male-headed households, the decision-maker regarding plots was male 84% of the time, and female 12% of the time. Similarly, the primary worker for all plots in female-headed households was always female. However, in male-headed households the primary worker on plots is female 36% of the time.

Table 16 and Table 17 show the breakdown of the decision-maker and primary worker of plots by gender, disaggregated by household head gender. At the plot level, female members in female-headed households manage nearly all of the plots; whereas in male-headed households male members are in charge of 85% of the plots and female members 11% of the plots.

Table 16. Gender of decision-maker of plots at plot level, by household head gender

	Female-headed HH		Male-headed HH		Total Sample	
	N	Col%	N	Col%	N	Col%
Female is the decision-maker	1353	94%	731	11%	2084	25%
Male is the decision-maker	51	4%	5784	85%	5835	70%
Mixed	39	3%	327	5%	366	4%
N	1443	100%	6842	100%	8285	100%

On average, female members are primary workers on 82% of the plots in female-headed households. In contrast, male members are primary workers on only 50% of the plots under male-headed households.

Table 17. Gender of Primary Worker of plots at plot level, by household head gender

	Female-headed HH		Male-headed HH		Total Sample	
	N	Col%	N	Col%	N	Col%
Female is the primary worker	1177	82%	2520	37%	3697	45%
Male is the primary worker	90	6%	3411	50%	3501	42%
Mixed	176	12%	911	13%	1087	13%
N	1443	100%	6842	100%	8285	100%

10. Agricultural production

10.1. Agricultural inputs

Over 93% of households reported using only seeds from their own production, while 18% of households receive or exchange seeds with other farmer(s) for at least one of the crops.

In terms of agricultural inputs, almost all households used some compost or manure on at least one of their plots, but far fewer used any chemical fertilizers or pesticides. Around 70% of the households report using irrigation on any of their plots, mostly in the form of flow canals.

Figure 10. Use of agricultural inputs, by household head gender
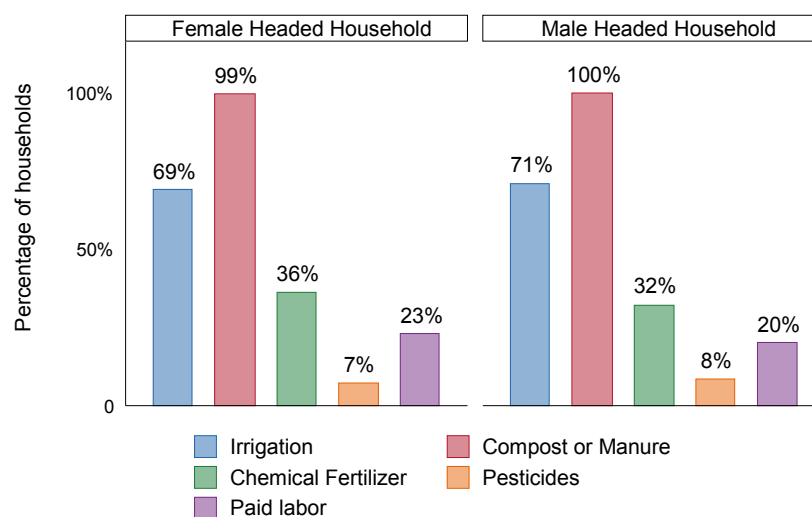
Households may have multiple irrigation methods, among which flow canal is the most prevalent (66%). Figure 11 shows the type of irrigation used by households. Note that a household is counted as using a certain type of irrigation if they use this type of irrigation on at least one of their plots.

Figure 11. Types of irrigation
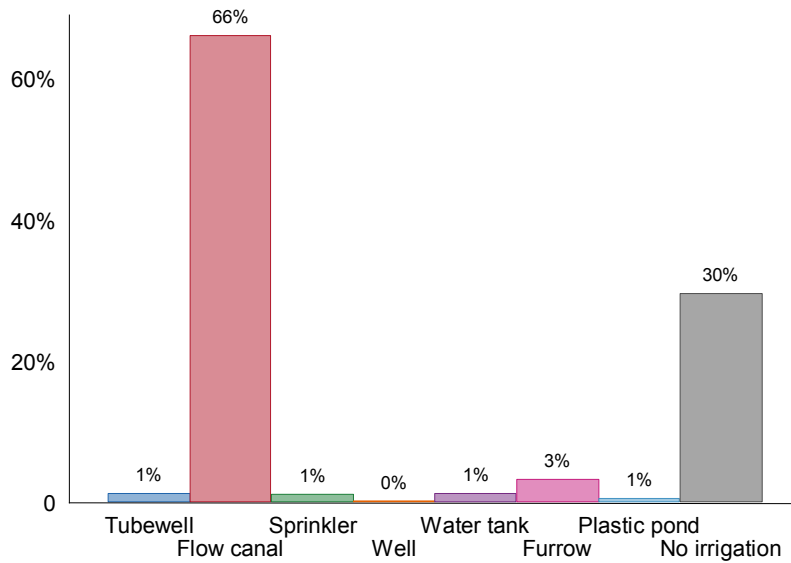
Figure 12 shows the average percentage of plots on which each household uses various inputs.

Figure 12. Percentage of plots on which HH is using improved inputs, by household head gender[12]
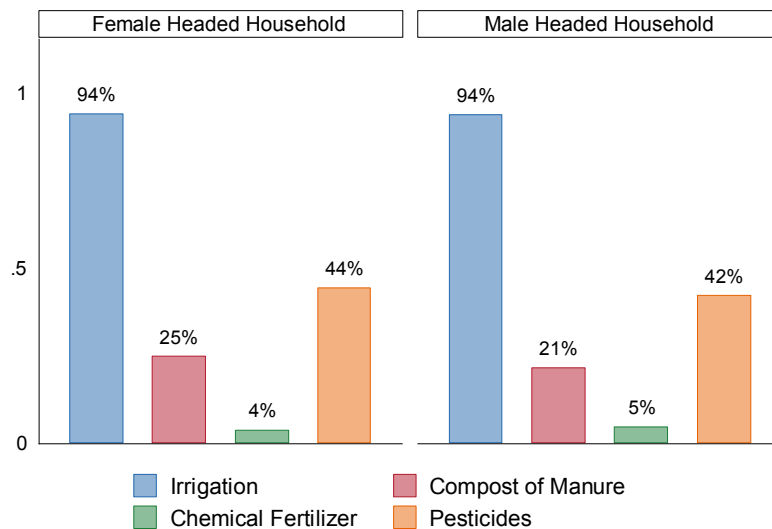
Figures 13 and 14 show the amount of money spent on various inputs. Note that this includes all households who grow crops, and the median amount of money spent on most inputs is zero. The amount of money spent on inputs is much larger in the hills, and on average households spend most of this on hired labor. For instance, households in the hills spent an average of NRs 1290 ($13.40) on paid labor, but those in the mountain spent an average of Nrs 259 ($2.69).

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[12] Paid labor data not collected at the plot level.

Figure 13: Agricultural input expenditure (Rupees) by household head gender
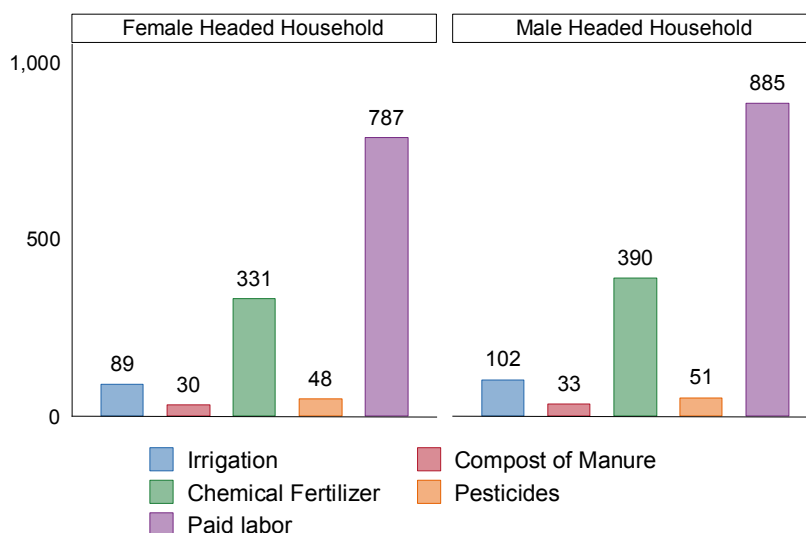
Figure 14: Agricultural input expenditure (Rupees), by region
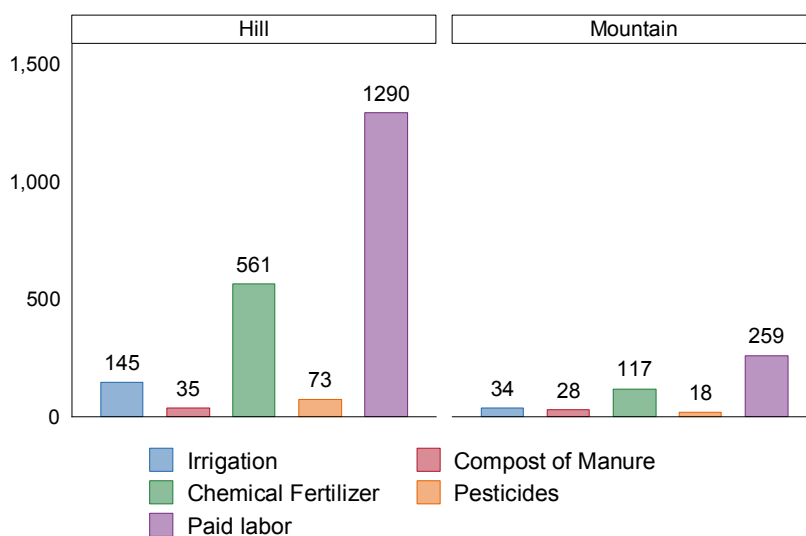
Table 18 presents the seed replacement rate as percentage of households who grew specific crops. Seeds are considered as replacements if the households growing the specific crop received seeds from Agrovet, local markets or shops, government (DADO/NARC), private companies, non-governmental organizations (NGOs) or international non-governmental organizations (INGOs).

Table 18. Percentage of Households who replaced seed in current season[13]

	Number of households that grew this crop	Total area planted (ha)	Percentage of area where seed was replaced during last planting
Main Paddy	1102	189.4	9.27%
Wheat	1414	312.8	6.37%
Summer Maize	1126	177.8	13.40%
Potato	393	22.3	35.13%
All four crops	1587	526.4	9.84%

Note: This table include intercropped plots.

10.2. Crop Commercialization

Most agricultural production is for home consumption, and very few households sell crops.

Figure 15: HHs planting and selling common crops, by HH head gender

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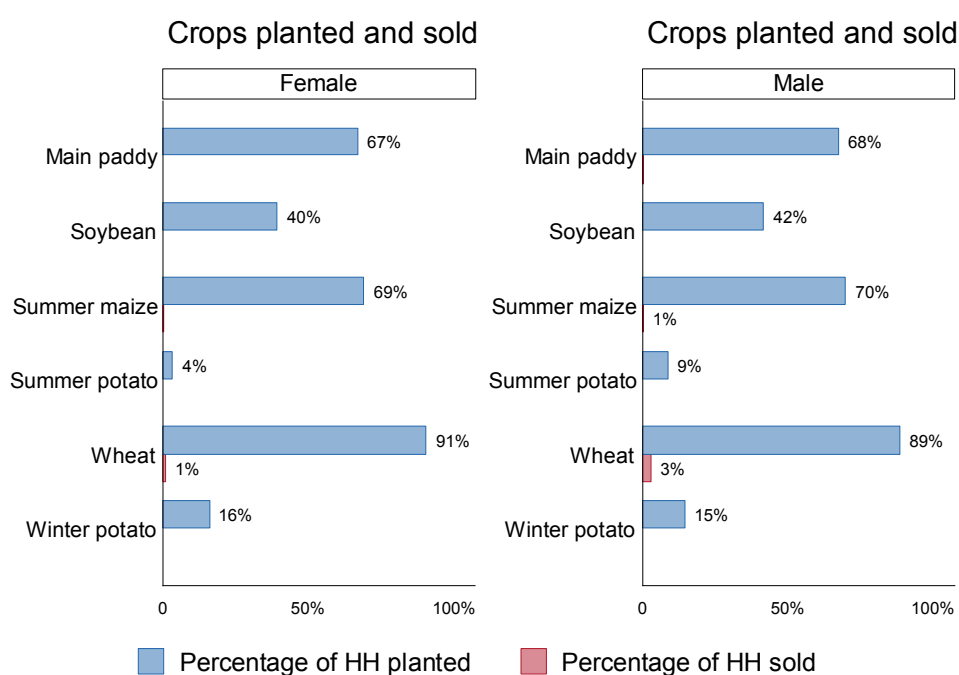
[13] Sample conditional on households who grow crops

10.3. Agriculture production

Agriculture production is measured in weight (kg) and agriculture production value is measured in Rupees calculated using the market value of crops harvested, regardless of whether or not they were sold. The value for crops is generated by assigning a price to each crop based on the best available estimate of farm gate prices. For crops that are frequently sold, prices are calculated based on self-reported sales data at the household level. For crops where insufficient sales data is available in the baseline, estimated prices were obtained through third party sources[14]. The prices used for each crop can be found in the Appendix 1.

Figure 16 shows the share of households growing each of the most common crops. The most commonly produced crops are paddy and wheat. Production of paddy (main and upland combined) constitutes around 44% of total production volume. Staple crops, including paddy, wheat, maize, potato, constitute the majority of production volume.

Figure 16. Share of households growing common crops (percent)
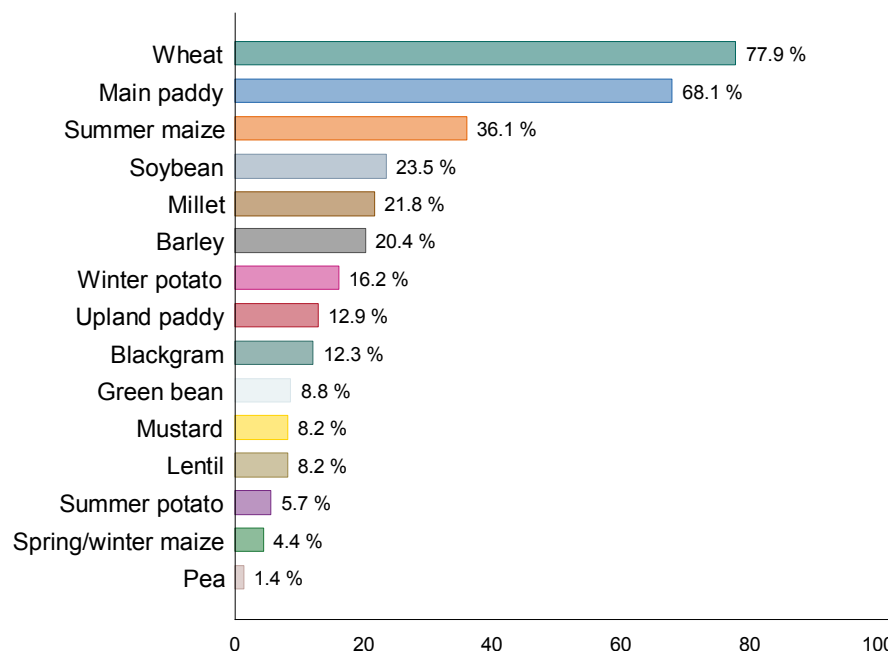
Figure 17. Share of households growing the main crop by region (percent)

Hill	
Wheat	80.1 %
Main paddy	68.5 %
Summer maize	43.5 %
Soybean	18.5 %
Winter potato	18.4 %
Millet	14.6 %
Blackgram	13.0 %
Barley	13.0 %
Upland paddy	11.8 %
Mustard	11.2 %
Lentil	10.6 %
Spring/winter maize	5.6 %
Green bean	3.7 %
Pea	1.9 %
Summer potato	1.5 %

Mountain	
Wheat	74.8 %
Main paddy	67.6 %
Millet	32.1 %
Barley	30.9 %
Soybean	30.6 %
Summer maize	25.5 %
Green bean	15.9 %
Upland paddy	14.5 %
Winter potato	13.0 %
Summer potato	11.7 %
Blackgram	11.2 %
Lentil	4.7 %
Mustard	3.9 %
Spring/winter maize	2.7 %
Pea	0.8 %

Figure 18. Average annual production of common crops (kg/household)

Crop	kg/household
Main paddy	474
Wheat	271
Winter potato	252
Summer maize	238
Spring/winter maize	197
Summer potato	180
Upland paddy	148
Milet	103
Barley	97
Mustard	35
Green bean	31
Soybean	30
Lentil	29
Blackgram	21
Pea	17
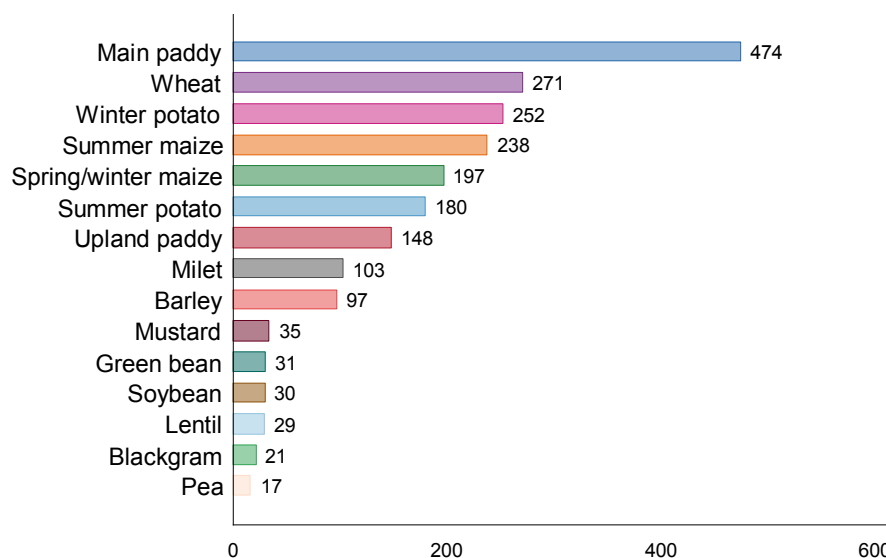
Total production value is highest for paddy, potato, and wheat.

Figure 19. Average annual production value of common crops (Rupees/household)

Crop	Value
Main paddy	9488
Winter potato	5805
Wheat	5732
Summer potato	4144
Summer maize	3836
Blackgram	2984
Upland paddy	2967
Spring/winter maize	2410
Soybean	2381
Barley	2186
Mustard	2137
Milet	1663
Green bean	1510
Lentil	1106
Pea	674

Households in hill areas have higher production than households in mountain areas, especially for paddy.

Figure 20. Production of common crops by region (kg/household)

Hill		Mountain	
Main paddy	578	Main paddy	321
Winter potato	298	Wheat	243
Wheat	288	Spring/winter maize	197
Summer maize	275	Summer potato	177
Summer potato	197	Summer maize	170
Spring/winter maize	197	Winter potato	159
Upland paddy	142	Upland paddy	155
Milet	88	Barley	121
Barley	64	Milet	113
Mustard	38	Green bean	41
Lentil	35	Soybean	23
Soybean	35	Mustard	22
Blackgram	22	Blackgram	20
Green bean	19	Lentil	17
Pea	18	Pea	14

Figure 21. Value of production of common crops by region (Rupees/household)

Hill

Crop	Value
Main paddy	11559
Winter potato	6843
Wheat	6101
Summer potato	4546
Summer maize	4426
Blackgram	3114
Upland paddy	2849
Soybean	2761
Spring/winter maize	2410
Mustard	2314
Barley	1450
Milet	1424
Lentil	1331
Green bean	929
Pea	725

Mountain

Crop	Value
Main paddy	6427
Wheat	5138
Summer potato	4082
Winter potato	3659
Upland paddy	3109
Blackgram	2792
Summer maize	2727
Barley	2722
Spring/winter maize	2409
Green bean	2019
Soybean	1830
Milet	1829
Mustard	1338
Lentil	628
Pea	548

Female-headed households have slightly lower production than male-headed households.

Figure 22. Production by household head gender (kg/household)

Female-headed household

Crop	Value
Main paddy	452
Wheat	227
Summer maize	213
Spring/winter maize	176
Winter potato	144
Summer potato	117
Upland paddy	102
Barley	86
Milet	76
Lentil	34
Mustard	33
Soybean	30
Green bean	21
Blackgram	17
Pea	14

Male-headed household

Crop	Value
Main paddy	480
Winter potato	285
Wheat	283
Summer maize	245
Spring/winter maize	203
Summer potato	188
Upland paddy	159
Milet	108
Barley	99
Mustard	35
Green bean	33
Soybean	30
Lentil	28
Blackgram	23
Pea	18

Figure 23. Value production by household head gender (Rupees/household)

Female-headed household		Male-headed household

Female-headed household:
- Main paddy: 9048
- Wheat: 4797
- Summer maize: 3425
- Winter potato: 3314
- Summer potato: 2688
- Soybean: 2378
- Blackgram: 2376
- Spring/winter maize: 2153
- Upland paddy: 2046
- Mustard: 2007
- Barley: 1931
- Lentil: 1264
- Milet: 1231
- Green bean: 1033
- Pea: 558

Male-headed household:
- Main paddy: 9603
- Winter potato: 6541
- Wheat: 5977
- Summer potato: 4321
- Summer maize: 3938
- Upland paddy: 3180
- Blackgram: 3164
- Spring/winter maize: 2488
- Soybean: 2382
- Barley: 2231
- Mustard: 2175
- Milet: 1740
- Green bean: 1611
- Lentil: 1063
- Pea: 714

10.4. Agricultural yields by weight

Table 19 and Table 20 show the most common crops cultivated by households. Yields are calculated using self-reported production and plot size. Using the *Statistical Informational on Nepalese Agriculture*[15] as a benchmark, our sample shows similar productivity levels for most crops. For potatoes, however, our sample yield is 4.8 tons/HA, which is significantly lower than the benchmark value of 13.58 tons/Ha. However, it is important to notice that our sample of potato production is quite small. The entire mono-cropped sample of potato plots (which are the ones used to calculate yield) constitute just 18 Ha. This is compared to over 200 Ha for wheat and paddy, and just under 100 for maize. Given this small sample, it is not entirely surprising that the yield numbers are far off of the national average. The hill and mountain areas show different crop productivities, which is as expected, since different crops are suited to different altitudes.

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[15] Government of Nepal. Agri-Business Promotion and Statistics Division, Statistics Section, Ministry of Agricultural Development, *Statistical Information on Nepalese Agriculture*, Singha Durbar, Kathmandu, Nepal: , 2011-12.

**Table 19. Productivity for common crops (Tons/HA),
by region**

	Hill Districts			Mountain Districts			Sample
	N	Mean	SD	N	Mean	SD	N
Wheat	80.1%	1.39	1.00	74.7%	1.50	1.04	77.9%
Main Paddy	68.5%	3.12	2.13	67.3%	2.69	2.24	68.0%
Summer Maize	43.3%	2.01	1.85	25.3%	1.80	1.61	35.9%
Soybean	18.4%	1.44	1.37	30.6%	1.30	1.22	23.4%
Millet	14.6%	1.39	1.23	32.0%	1.61	1.36	21.8%
Potato	19.5%	5.62	6.18	24.4%	3.81	3.74	21.5%
Barley	12.9%	1.05	0.85	30.9%	1.56	1.07	20.3%
Upland Paddy	11.7%	1.56	1.39	14.5%	2.09	1.60	12.9%
Blackgram	12.9%	0.81	0.85	11.2%	0.81	0.78	12.2%
Green Bean	3.7%	1.90	2.25	15.9%	1.14	1.19	8.8%
Mustard	11.1%	0.81	0.81	3.9%	0.97	0.84	8.1%
Lentil	10.5%	0.88	1.48	4.7%	0.52	0.42	8.1%
N	940			660			1600

Note: Only monocropped plots included in caclulation. Variables are winsorized in at 1% in the upper tail

Yields for female-headed households are lower than for male-headed households for nearly all crops.

**Table 20. Productivity for common crops (Tons/HA),
by household head gender**

	Female-headed HH			Male-headed HH			Sample
	N	Mean	SD	N	Mean	SD	N
Wheat	77.1%	1.31	0.91	78.1%	1.47	1.04	77.9%
Main Paddy	68.0%	2.81	2.10	68.0%	2.98	2.21	68.0%
Summer Maize	36.9%	1.85	1.48	35.6%	1.97	1.86	35.9%
Soybean	18.3%	1.30	1.12	24.8%	1.38	1.32	23.4%
Millet	16.5%	1.34	0.99	23.1%	1.56	1.36	21.8%
Potato	21.0%	4.20	4.76	21.6%	4.91	5.37	21.5%
Barley	14.0%	1.43	1.10	21.9%	1.36	1.01	20.3%
Upland Paddy	11.6%	1.52	1.44	13.2%	1.87	1.53	12.9%
Blackgram	14.9%	0.67	0.61	11.5%	0.86	0.88	12.2%
Green Bean	4.9%	1.44	2.17	9.7%	1.32	1.47	8.8%
Mustard	8.5%	0.83	0.89	8.0%	0.85	0.80	8.1%
Lentil	9.5%	0.74	0.97	7.8%	0.81	1.41	8.1%
N	328			1272			1600

Note: Only monocropped plots included in caclulation. Variables are winsorized in at 1% in the upper tail

Yield is also calculated in Rupees/HA, with the numerator being the value of crops harvested. Gross yield is calculated using the total value of harvested crops per hectare, while net yield subtracts money spent on inputs from the gross yield figures. This includes money spent on fertilizer, pesticides, hired labor, and irrigation. However, it does not impute a cost for household and other unpaid labor.

Gross yields were slightly higher than net yields.

Table 21. Total household agriculture productivity (Rupees/HA)

	N	Mean	SD	Median
Total net productivity	1600	18,033	14,795	14,534
Total gross productivity	1600	19,565	15,576	15,580

Note: Values winsorized at upper 1% tail.

Productivity is similar across agro-ecological zones.

**Table 22. Total HH agriculture productivity (Rupees/HA),
by region**

	Hill Districts				Mountain Districts			
	N	Mean	SD	Median	N	Mean	SD	Median
Total net productivity	940	17,302	14,152	14,190	660	19,074	15,618	15,093
Total gross productivity	940	19,294	15,576	15,527	660	19,951	15,579	15,731

Note: Values winsorized at upper 1% tail.

Female-headed households have lower agricultural productivity than male-headed households.

**Table 23. Total HH agriculture productivity (Rupees/HA),
by household head gender**

	Female-headed household				Male-headed household			
	N	Mean	SD	Median	N	Mean	SD	Median
Total net productivity	328	16,428	12,197	14,000	1272	18,447	15,371	14,668
Total gross productivity	328	17,863	12,526	15,015	1272	20,003	16,245	15,780

Note: Values winsorized at upper 1% tail.

Table 24 shows the gross productivity for each of the most commonly grown crops. Soybeans, green beans, and black gram were the most productive. Potatoes were the least productive.

Table 24. Gross productivity in monetary values for common crops (Rupees/HA), by region

	Hill			Mountain			Sample
	N	Mean	SD	N	Mean	SD	N
Wheat	80.1%	29,424	21,069	74.7%	31,731	22,073	77.9%
Main paddy	68.5%	62,307	42,549	67.3%	53,822	44,878	68.0%
Summer maize	43.3%	32,263	29,744	25.3%	28,887	25,912	35.9%
Soybean	18.4%	116,000	109,000	30.6%	104,000	97,801	23.4%
Millet	14.6%	22,467	19,789	32.0%	25,965	21,925	21.8%
Potato	19.5%	5,171	7,298	24.4%	3,292	3,032	21.5%
Barley	12.9%	23,738	19,219	30.9%	35,269	24,204	20.3%
Upland paddy	11.7%	31,136	27,837	14.5%	41,879	32,086	12.9%
Blackgram	12.9%	113,000	117,000	11.2%	113,000	109,000	12.2%
Green bean	3.7%	93,502	111,000	15.9%	56,207	58,815	8.8%
Mustard	11.1%	50,066	49,902	3.9%	59,933	51,908	8.1%
Lentil	10.5%	32,984	55,629	4.7%	19,622	15,561	8.1%
N	940			660			1600

Note: Only mono-cropped plots included in calculation
Variables winsorized at upper 1% tail

Table 25. Gross productivity in monetary values for common crops (Rupees/HA), household head gender

	Female-headed HH			Male-headed HH			Sample
	N	Mean	SD	N	Mean	SD	N
Wheat	77.1%	27,705	19,282	78.1%	31,007	21,979	77.9%
Main paddy	68.0%	56,207	42,008	68.0%	59,524	44,116	68.0%
Summer maize	36.9%	29,774	23,800	35.6%	31,684	29,884	35.9%
Soybean	18.3%	104,000	89,242	24.8%	110,000	106,000	23.4%
Millet	16.5%	21,659	15,913	23.1%	25,126	21,956	21.8%
Potato	21.0%	2,971	4,295	21.6%	4,623	6,060	21.5%
Barley	14.0%	32,371	24,933	21.9%	30,746	22,859	20.3%
Upland paddy	11.6%	30,445	28,733	13.2%	37,432	30,576	12.9%
Blackgram	14.9%	92,743	85,292	11.5%	119,000	121,000	12.2%
Green bean	4.9%	70,996	107,000	9.7%	64,826	72,302	8.8%
Mustard	8.5%	51,180	54,609	8.0%	52,276	49,285	8.1%
Lentil	9.5%	27,684	36,504	7.8%	30,459	52,933	8.1%
N	328			1272			1600

Note: Only mono-cropped plots included in calculation
Variables winsorized at upper 1% tail

11. Livestock

11.1. Livestock ownership

More than 67% of the households own goats, and around 76.5% of the households have bullocks. As shown in Figure 24, other common livestock are cattle, buffalo, hens, and chickens. Ownership of sheep (7%), horse (6%), rabbit (5%), and other livestock (1%) is quite rare.

Figure 24 shows the proportion of households that own and that commercialize each type of livestock.[16]

Figure 24. Livestock ownership and commercialization[17]

Percentage of Household

HH owned livestock   HH sold livestock

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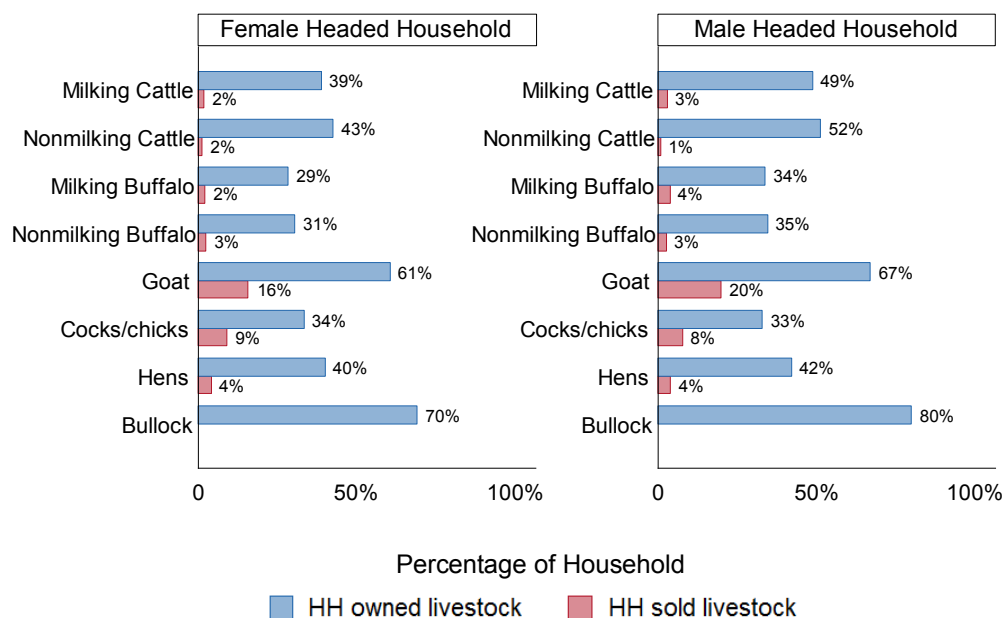
[16] Sales data on bullocks not collected.
[17] Conditional on households that owned livestock. A household is considered owning livestock if they reported owning the livestock during the last 12 months.

Table 26. Livestock ownership sales and income[18]

	Total								
	Number owned			Number sold			Income from sales (Rupees)		
	N	Mean	SD	N	Mean	SD	N	Mean	SD
Milking cattle	43.3%	1.27	0.52	2.7%	1.12	0.39	2.7%	7445.35	4445.02
Nonmilking cattle	49.3%	1.50	0.84	0.9%	1.29	0.47	0.9%	3807.14	3803.53
Milking buffalo	30.1%	1.09	0.30	3.6%	1.07	0.32	3.6%	28747.37	15630.46
Nonmilking buffalo	32.4%	1.24	0.56	2.7%	1.19	0.82	2.7%	16530.23	26245.43
Goat	63.6%	4.94	5.19	19.3%	2.91	4.01	19.3%	12868.34	15497.95
Cock/chick	29.4%	5.55	24.76	8.1%	24.35	119.74	8.1%	11994.69	55940.70
Hen	39.5%	2.76	3.96	4.2%	5.25	18.23	4.3%	2579.49	6567.49
Bullock	76.5%	2.07	0.92	0%	.	.	0%	.	.
Sheep	7.1%	7.27	12.34	0%	.	.	0%	.	.
Pig	3.5%	1.75	1.28	0%	.	.	0%	.	.
Horse	6.0%	2.03	1.59	0%	.	.	0%	.	.
Rabbit	4.4%	3.74	3.44	0%	.	.	0%	.	.
Other livestock	4.0%	3.19	3.92	0%	.	.	0%	.	.
N	1600								

Hill households tend to have more goats, buffaloes, bullocks, sheep, pigs, and chickens, whereas mountain households tend to own more horses and rabbits.

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[18]In the table, N refers to the proportion of households that report owning the animal at the time of the survey.

Table 27. Livestock ownership sales and income, by region

	Hill									Mountain								
	Number owned			Number sold			Income from sales (Rupees)			Number owned			Number sold			Income from sales (Rupees)		
	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD
Milking cattle	32.3%	1.22	0.48	2.6%	1.17	0.48	2.6%	6,485	4,793	58.9%	1.31	0.55	2.9%	1.05	0.23	2.9%	8,658	3,738
Nonmilking cattle	40.3%	1.42	0.79	1.0%	1.22	0.44	1.0%	3,367	3,960	62.0%	1.57	0.89	0.8%	1.40	0.55	0.8%	4,600	3,798
Milking buffalo	34.6%	1.09	0.32	4.4%	1.10	0.37	4.4%	30,146	15,962	23.6%	1.07	0.26	2.4%	1.00	0.00	2.4%	25,163	14,615
Nonmilking buffalo	38.9%	1.26	0.57	3.9%	1.22	0.89	3.9%	18,116	27,996	23.0%	1.21	0.52	0.9%	1.00	0.00	0.9%	6,750	3,094
Goat	73.9%	4.25	3.53	25.1%	2.81	3.96	25.1%	11,269	11,124	48.8%	6.42	7.42	10.9%	3.22	4.18	10.9%	18,110	24,343
Cock/chick	37.3%	6.57	28.60	10.6%	30.28	136.09	10.6%	14,133	63,634	18.2%	2.55	2.20	4.5%	4.57	4.48	4.5%	4,867	5,350
Hen	48.1%	2.87	4.43	4.9%	5.85	21.82	4.9%	2,222	7,271	27.3%	2.51	2.36	3.2%	3.95	4.77	3.3%	3,327	4,844
Bullock	75.9%	2.12	0.88	0%	.	.	0%	.	.	77.4%	2.01	0.97	0%	.	.	0%	.	.
Sheep	7.7%	2.31	2.12	0%	.	.	0%	.	.	6.2%	16.00	17.19	0%	.	.	0%	.	.
Pig	5.7%	1.76	1.30	0%	.	.	0%	.	.	0.3%	1.50	0.71	0%	.	.	0%	.	.
Horse	1.0%	1.22	0.44	0%	.	.	0%	.	.	13.2%	2.12	1.65	0%	.	.	0%	.	.
Rabbit	1.0%	5.33	5.17	0%	.	.	0%	.	.	9.2%	3.51	3.10	0%	.	.	0%	.	.
Other livestock	2.9%	1.67	1.14	0%	.	.	0%	.	.	5.6%	4.30	4.78	0%	.	.	0%	.	.
N	940									660								

Table 28. Livestock ownership sales and income, by household head gender

	Female-headed HH									Male-headed HH								
	Number owned			Number sold			Income from sales (Rupees)			Number owned			Number sold			Income from sales (Rupees)		
	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD
Milking cattle	36.0%	1.24	0.50	2.1%	1.00	0.00	2.1%	7,443	3,972	45.2%	1.28	0.53	2.8%	1.14	0.42	2.8%	7,446	4,583
Nonmilking cattle	42.4%	1.34	0.60	1.5%	1.40	0.55	1.5%	2,720	3,883	51.0%	1.53	0.89	0.7%	1.22	0.44	0.7%	4,411	3,850
Milking buffalo	25.9%	1.04	0.24	2.4%	1.25	0.71	2.4%	34,500	31,514	31.1%	1.10	0.31	3.9%	1.04	0.20	3.9%	27,808	11,566
Nonmilking buffalo	29.3%	1.20	0.47	2.7%	1.22	0.67	2.7%	13,944	12,496	33.2%	1.25	0.58	2.7%	1.18	0.87	2.7%	17,215	28,923
Goat	58.2%	3.73	3.82	16.2%	2.93	3.33	16.2%	11,055	10,437	64.9%	5.22	5.42	20.0%	2.90	4.15	20.0%	13,245	16,345
Cock/chick	30.8%	7.54	33.47	9.5%	31.39	161.22	9.5%	18,184	92,682	29.1%	5.00	21.82	7.8%	22.14	104.38	7.8%	10,057	38,389
Hen	39.0%	2.66	3.23	4.3%	2.50	1.70	4.3%	1,233	1,015	39.6%	2.79	4.12	4.2%	5.98	20.46	4.2%	2,929	7,326
Bullock	67.4%	1.96	0.89	0%	.	.	0%	.	.	78.9%	2.10	0.92	0%	.	.	0%	.	.
Sheep	5.2%	4.71	9.41	0%	.	.	0%	.	.	7.5%	7.73	12.77	0%	.	.	0%	.	.
Pig	4.9%	1.44	0.73	0%	.	.	0%	.	.	3.1%	1.88	1.44	0%	.	.	0%	.	.
Horse	1.5%	1.60	1.34	0%	.	.	0%	.	.	7.2%	2.06	1.61	0%	.	.	0%	.	.
Rabbit	3.0%	2.90	1.97	0%	.	.	0%	.	.	4.7%	3.88	3.62	0%	.	.	0%	.	.
Other livestock	2.1%	4.86	5.67	0%	.	.	0%	.	.	4.5%	2.98	3.66	0%	.	.	0%	.	.
N	328									1272								

11.2. Livestock production and commercialization

Sales of animal products are extremely low, as most people use animal product for home consumption. In Table 29-Table 31, statistics are calculated per household, not per animal. For the production statistics, households that own an animal with ability to produce (such as a milking cow) but that reported zero production are included in the calculations. Average values for sales and income are calculated only for households that sold some of the selected product.

Table 29. Livestock products production, sales and income

	Total Sample								
	Production (Numbers/Liters per year)			Sales (Numbers/Liters per year)			Income (Rupees per year)		
	N	Mean	SD	N	Mean	SD	N	Mean	SD
Cow milk	46.8%	309.48	328.10	0.5%	321.25	307.17	0.5%	9825.00	10537.11
Buffalo milk	32.9%	687.01	696.11	6.3%	383.64	352.11	6.3%	16102.20	18806.16
Eggs	41.9%	46.88	80.96	2.3%	64.41	144.78	2.3%	789.32	1639.25
N	1600			1600			1600		

Table 30. Livestock products sales and income, by region

	Hill									Mountain								
	Production (Numbers/Liters per year)			Sales (Numbers/Liters per year)			Income (Rupees per year)			Production (Numbers/Liters per year)			Sales (Numbers/Liters per year)			Income (Rupees per year)		
	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD
Cow milk	36.1%	303.97	290.79	0.7%	355.71	314.64	0.7%	11000.00	10800.46	62.0%	314.06	356.37	0.2%	80.00	.	0.2%	1600.00	.
Buffalo milk	37.6%	735.58	743.36	8.1%	373.74	352.29	8.1%	14177.24	15370.68	26.2%	587.90	577.46	3.6%	415.00	357.19	3.6%	22197.92	26474.57
Eggs	50.6%	47.92	86.47	2.8%	78.50	171.12	2.8%	842.89	1893.96	29.4%	44.33	65.62	1.7%	31.09	22.69	1.7%	662.73	825.18
N	940			940			940			660			660			660		

Table 31. Livestock products sales and income, by household head gender

	Female-headed HH									Male-headed HH								
	Production (Numbers/Liters per year)			Sales (Numbers/Liters per year)			Income (Rupees per year)			Production (Numbers/Liters per year)			Sales (Numbers/Liters per year)			Income (Rupees per year)		
	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD
Cow milk	39.0%	325.68	449.99	0.9%	290.00	372.42	0.9%	11366.67	15107.72	48.7%	306.14	297.15	0.4%	340.00	307.57	0.4%	8900.00	8793.75
Buffalo milk	28.7%	609.36	554.74	5.5%	258.61	200.20	5.5%	7979.17	5860.30	34.0%	703.91	722.66	6.4%	411.09	372.67	6.4%	17885.31	20178.60
Eggs	40.2%	51.58	108.44	2.1%	153.14	308.82	2.1%	1731.43	3450.93	42.3%	45.73	72.73	2.4%	43.70	62.80	2.4%	569.50	779.49
N	328			328			328			1272			1272			1272		

11.3. Animal productivity

Animal productivity is measured by total amount of animal products divided by total number of animals owned per household. Animal productivity is relatively consistent across different types of households. However, buffalo milk productivity is higher among male-headed households and hill households. In the following table, the productivity is calculated for all households that own each type of livestock, even if the livestock did not produce any eggs/milk. 26% of the households that had chickens reported producing no eggs, which contributes to the relatively low rate of hen productivity.

Table 32. Livestock products productivity

	Total Sample		
	N	Mean	SD
Eggs per hen (numbers)	39.1%	21.3	28.9
Cow milk per cow (liters)	43.0%	263.4	269.7
Buffalo milk per buffalo (liters)	29.8%	640.4	590.6
N	1600		

Note: Means calculated only on households that own the animal

Table 33. Livestock products productivity, by household head gender

	Female-headed HH			Male-headed HH		
	N	Mean	SD	N	Mean	SD
Eggs per hen (numbers)	38.7%	22.9	30.3	39.2%	20.9	28.5
Cow milk per cow (liters)	35.7%	274.5	271.9	44.9%	260.8	268.0
Buffalo milk per buffalo (liters)	25.9%	595.8	549.2	30.8%	648.6	593.8
N	328			1272		

Note: Means calculated only on households that own the animal

Table 34. Livestock products productivity, by region

	Hill Districts			Mountain Districts		
	N	Mean	SD	N	Mean	SD
Eggs per hen (numbers)	46.7%	21.4	28.8	24.0%	21.0	29.2
Cow milk per cow (liters)	31.6%	273.5	274.1	58.3%	255.5	266.3
Buffalo milk per buffalo (liters)	33.6%	663.4	600.5	23.3%	592.2	568.2
N	940			660		

Note: Means calculated only on households that own the animal

11.4. Livestock technology

As shown in Figure 25, 15% of the households who own any livestock use veterinary services and 9% of them had animals vaccinated. 84% of the households who own any goats, cattle or buffaloes have used stall-feeding, which is the most prevalent livestock technology used by animal owners. Less than a quarter of the households who own these animals use drenching or dipping practices. 13% of the households who own any kinds of poultry use deworming technology.

Figure 25. Percentage of household used livestock technology[19]
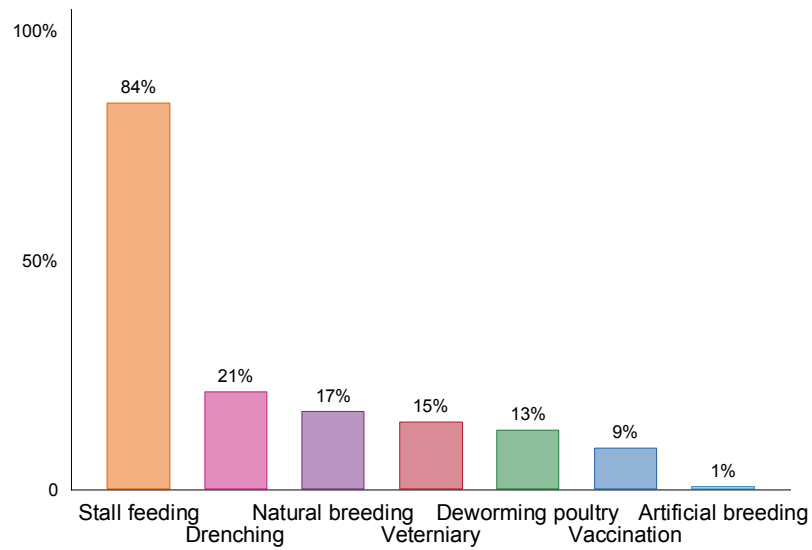
Practices of a variety of livestock technologies are generally more popular among households in the hills than those in the mountains, except for stall-feeding.

Figure 26. Percentage of household using livestock technology, by region[20]
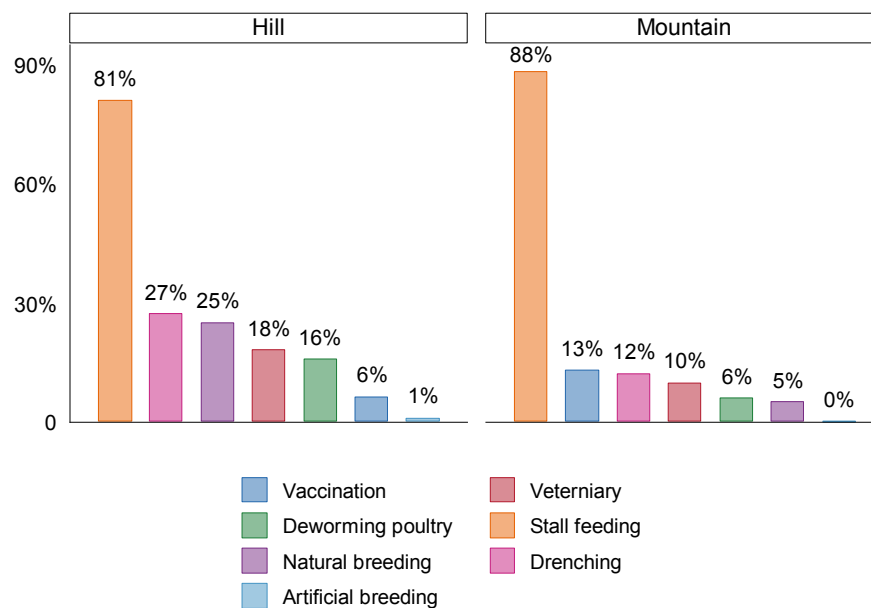
More female-headed households appear to deworm their poultry and stall-feed their livestock. However, fewer of them use other kinds of technology, compared to the male-headed households.

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[19] Percentage of household conditional on number of household who owned relevant animals.
[20] Percentage of household conditional on number of household who owned relevant animals.

Figure 27. Percentage of household used livestock technology, by household head gender[21]
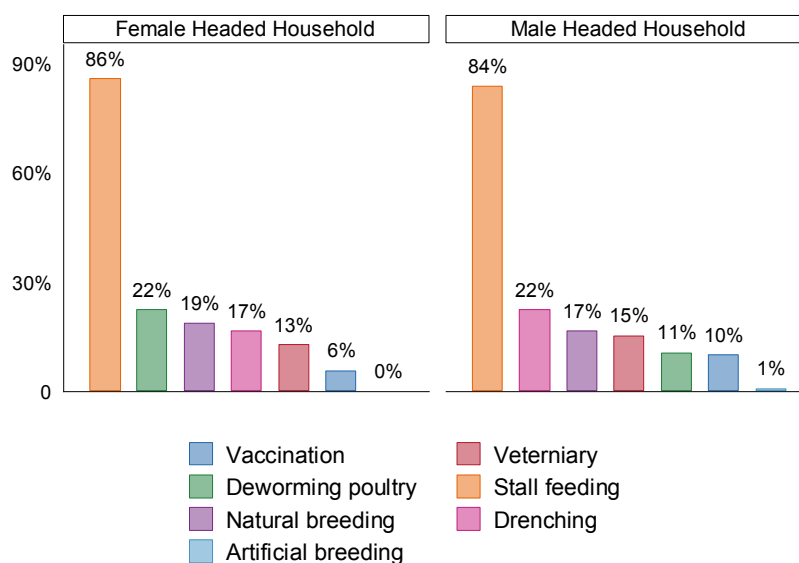
Households spend most on stall-feeding the livestock, conditional on households with relevant animals.

Figure 28. Household expenditure on livestock technology
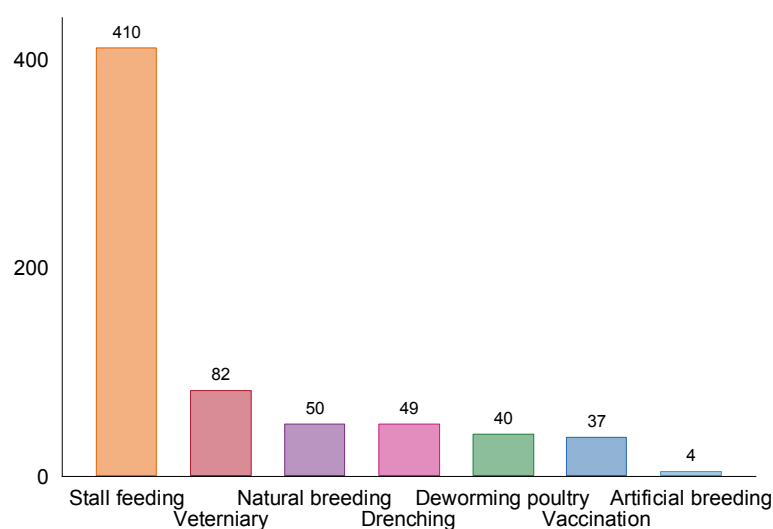
Livestock technology expenditures are low, and many households report zero expenditures. They are higher among households in the hills than those in the mountain areas.

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[21] Percentage of household conditional on number of household who owned relevant animals.

Figure 29. Household expenditure on livestock technology, by region

	Hill	Mountain
Stall feeding	480	307
Veteriniary	103	51
Natural breeding	75	
Drenching	62	30
Deworming poultry	56	
Vaccination	25	54
Artificial breeding	6	1
Natural breeding (Mountain)		12
Deworming poultry (Mountain)		4

Legend: Vaccination, Veteriniary, Deworming poultry, Stall feeding, Natural breeding, Drenching, Artificial breeding
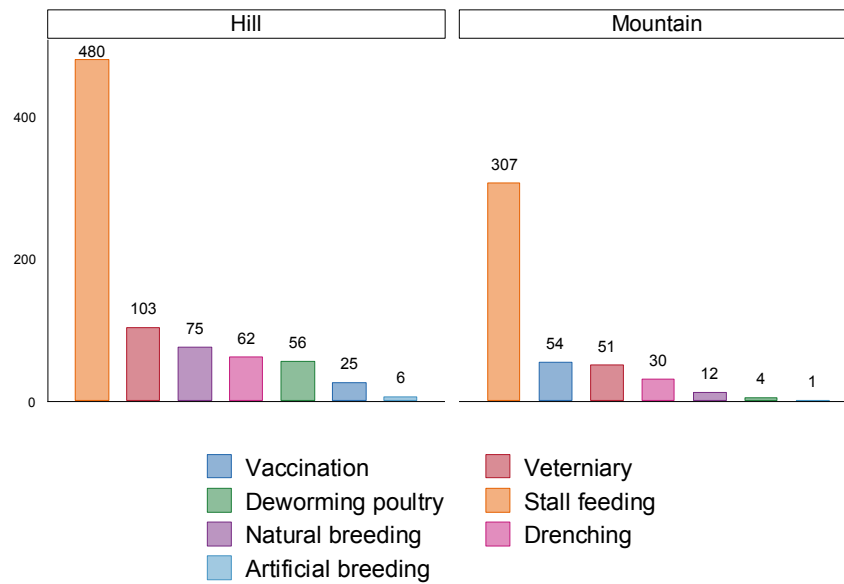
Female-headed households spent less on livestock technology than the male-headed households, except in terms of veterinary practices. They spend nearly half of what the male-headed households do on stall-feeding, and only a quarter of the amount on vaccination.

Figure 30. Household expenditure on livestock technology, by household head gender

	Female Headed Household	Male Headed Household
Stall feeding	253	450
Veteriniary	88	80
Natural breeding	44	51
Deworming poultry	34	42
Drenching	32	54
Artificial breeding	10	5
Vaccination	0	44

Legend: Vaccination, Veteriniary, Deworming poultry, Stall feeding, Natural breeding, Drenching, Artificial breeding
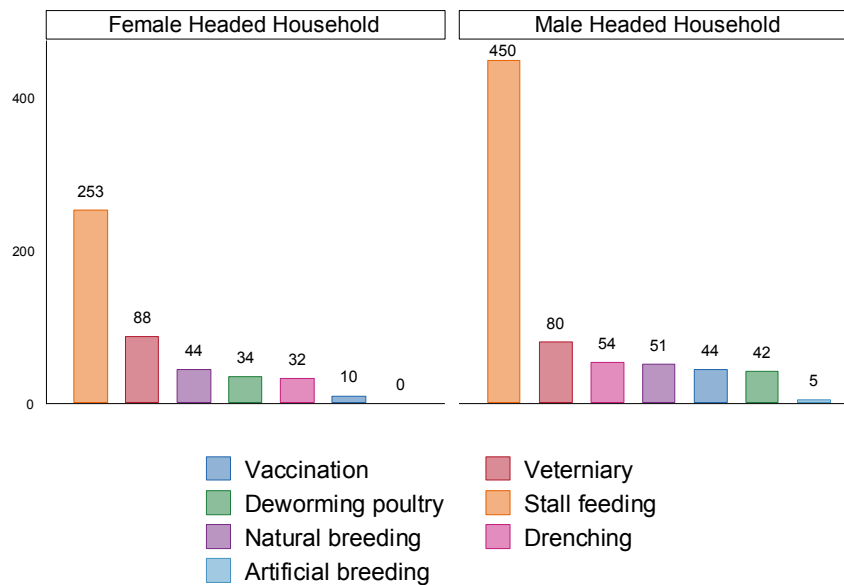
12.Farm income and expenditure

Income from crops is defined as the total amount of money received from crops on both monocropped and intercropped plots. Income from livestock is measured through sales of livestock and/or livestock products. Total farm income is measured through income from crops, livestock and other agricultural and livestock income. Households' crop expenditure includes expenditure on labor, irrigation, manure/compost, and pesticides. Households' livestock expenditure includes expenditures on forage or feed for livestock, labor, purchase of livestock, and technology and services for livestock. Total farm expenditure includes expenses from crops, livestock and other agriculture expenses such as purchases or rental of agricultural equipment.

Male-headed households tend to spend more than the female-headed households on all categories, except pesticides. Households in the hills have higher agricultural income and agricultural expenditure.

Table 35. Household farm income & expenditure, total & by region (Rupees)

	Total Sample			Hill Districts			Mountain Districts		
	Mean	SD	Median	Mean	SD	Median	Mean	SD	Median
Income from crops	675	1944	0	902	2221	0	353	1402	0
Income from livestock	4584	9030	0	7919	25431	0	4084	13430	0
Total farm income	6607	11525	0	7966	12196	1000	4671	10197	0
Expenditure from crops	1269	2307	0	1806	2626	500	505	1447	0
Expenditure from livestock	4584	9030	0	5679	9662	0	3025	7789	0
Total farm expenditure	8974	14026	2300	10299	14314	4150	7088	13392	745
N	1600			940			660		

Variables winsorized at upper 5% tail

Income from crops and animal products for male-headed households is almost twice the amount for female-headed households.

Table 36. Household farm income & expenditure by household head gender (Rupees)

	Female-headed HH			Male-headed HH		
	Mean	SD	Median	Mean	SD	Median
Income from crops	451	1544	0	733	2031	0
Income from livestock	5561	30527	0	6537	18326	0
Total farm income	4544	9184	0	7138	12001	0
Expenditure from crops	1251	2248	57.5	1274	2323	0
Expenditure from livestock	3512	7519	0	4861	9363	0
Total farm expenditure	7531	12366	1785	9347	14404	2500
N	328			1272		

Variables winsorized at upper 5% tail

13. Household assets, income & expenditure

13.1. Household assets

The baseline included data on ownership of a variety of common household and agricultural assets. Figure 31 shows the proportion of households with assets or not. The most commonly owned asset is a plough – about 86% of the households own at least one. Almost 80% of households have a bed, 70% of the households have access to a mobile phone, and 37% have radios. Male-headed households on average have more of all types of assets.
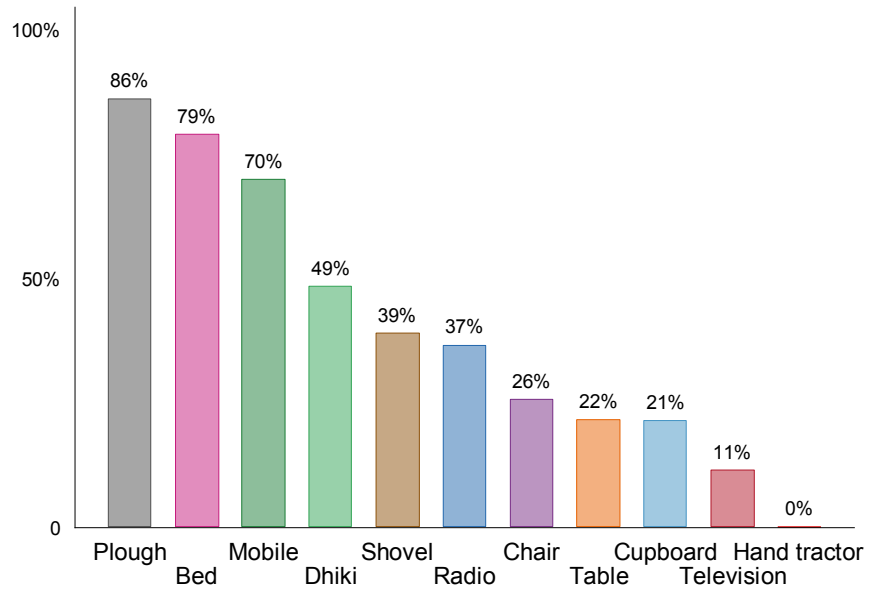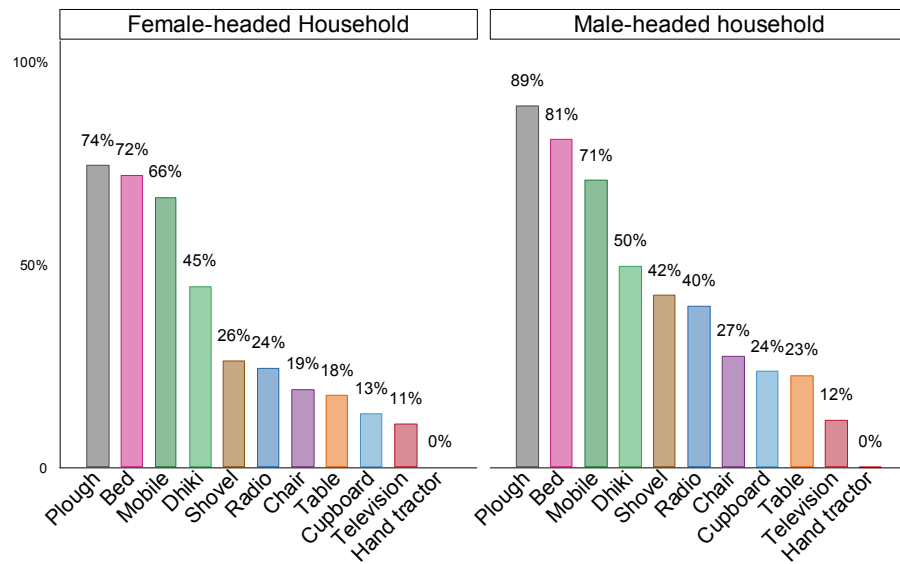
Figure 31. Household ownership of common assets[22]

Figure 32. Household ownership of common assets by household head gender

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[22] Dhiki is a traditional Nepali thresher.

13.2. Income

Total farm income is measured through sales and other income from agriculture and livestock. Total non-farm income includes income from non-agricultural personal business, renting land or houses, sale of land, remittances, interests and dividends, pension, allowances, earning from labors, gifts, and other sources. Table 37 shows a summary of income sources, and shows that income varies widely across sampled households. The most important sources of non-farm income are wages from male household members and remittances. Median annual household income was 51,000 Rupees.

Table 37. Household income, total & by region

	Total Sample			Hill Districts			Mountain Districts		
	Mean	SD	Median	Mean	SD	Median	Mean	SD	Median
Total farm income	6607	11525	0	7966	12196	1000	4671	10197	0
Total non-farm income	76207	84561	42000	83426	87845	50000	65926	78578	35000
Total income	85282	89129	51000	94245	92811	60000	72517	81998	42000
N	1600			940			660		

Variables winsorized at upper 5% tail

Table 38. Household income by household head gender

	Female-headed HH			Male-headed HH		
	Mean	SD	Median	Mean	SD	Median
Total farm income	4544	9184	0	7138	12001	0
Total non-farm income	88795	92151	55500	72961	82217	40000
Total income	95112	97181	60000	82747	86792	50000
N	328			1272		

Variables winsorized at upper 5% tail

13.3. Expenditure

Households were asked to report expenditures over the previous 12 months for infrequent events such as purchase of land, assets, and housing, or payment of school or health insurance. In contrast, households reported expenditures for the past week on frequent events, such as communication, transportation, phone credit, and leisure activities. Food expenditure data was also collected for the previous week. We extrapolated weekly expenditure data for the past 12 months, and median annual expenditures at 42,270 Rupees.

Table 39. Household expenditure by region

	Total Sample			Hill Districts			Mountain Districts		
	Mean	SD	Median	Mean	SD	Median	Mean	SD	Median
Total farm expenditure	8,974	14,026	2,300	10,299	14,314	4,150	7,088	13,392	745
Total frequent expenditure	673	854	350	709	874	350	622	822	338
Total infrequent expenditure	62,265	70,492	32,165	65,621	73,070	34,350	57,484	66,412	30,450
Total food expenditure	45,277	49,064	26,000	42,965	43,337	26,650	48,569	56,093	23,790
Total expenditure	122,877	107,693	86,530	124,867	108,370	88,375	120,041	106,740	84,060
N	1600			940			660		

Variables winsorized at upper 5% tail

Table 40. Household expenditure by household head gender

	Female-headed HH			Male-headed HH		
	Mean	SD	Median	Mean	SD	Median
Total farm expenditure	7,531	12,366	1,785	9,347	14,404	2,500
Total frequent expenditure	556	822	230	703	859	380
Total infrequent expenditure	47,247	60,299	24,050	66,137	72,408	35,230
Total food expenditure	34,330	39,663	19,370	48,100	50,841	28,080
Total expenditure	92,575	90,218	61,905	130,690	110,448	94,080
N	328			1272		

Variables winsorized at upper 5% tail

14. Rural finance

Almost two out of every three households had outstanding loans. Around 7% of the households have used loans for farm inputs and about 47% of the households have any kind of saving, including both formal and informal savings.

Figure 33. Access to rural finance
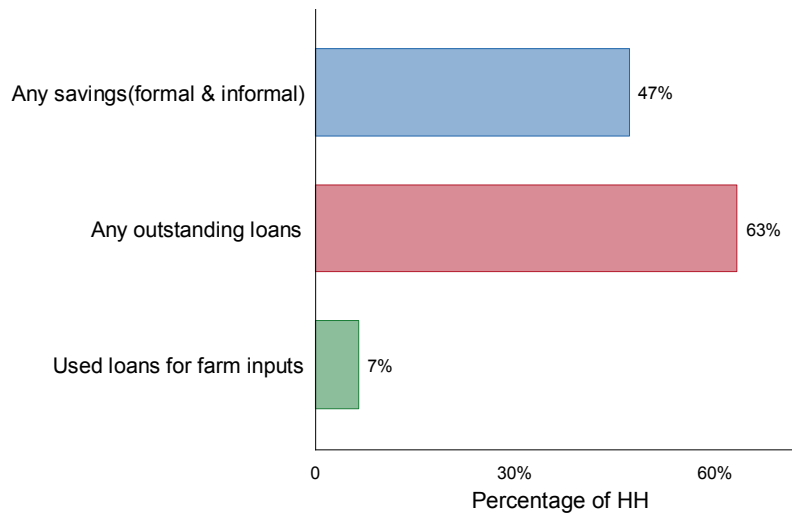
There are no major differences in the proportion of households who save or have loans by region or by gender. Households in the mountain areas tend to have larger amounts of formal savings than those in the hills.

Table 41. Rural finance by region

	Total Sample			Hill Districts			Mountain Districts		
	N	Mean Amount (Rupees)	SD	N	Mean Amount (Rupees)	SD	N	Mean Amount (Rupees)	SD
Formal savings	15.9%	40,323	86,335	19.0%	27,798	62,010	11.5%	69,821	122,000
Informal savings	35.6%	6,625	13,582	39.8%	6,366	13,494	29.5%	7,122	13,771
Outstanding loans	63.0%	73,847	97,954	62.1%	79,866	106,000	64.2%	65,558	85,765
Total loans	6.6%	32,046	38,328	8.1%	31,678	39,987	4.4%	33,010	34,239
N	1600			940			660		

-Data extracted between Aug 1 2012 and July 31 2013

-Variables winsorized at 1% upper tail

Female-headed households have greater formal savings but smaller informal savings than the male-headed households.

Table 42. Rural finance by household head gender

	Female-headed HH			Male-headed HH		
	N	Mean Amount (Rupees)	SD	N	Mean Amount (Rupees)	SD
Formal savings	17.1%	46,387	93,423	15.6%	38,616	84,404
Informal savings	37.2%	4,081	8,474	35.1%	7,319	14,602
Outstanding loans	58.8%	71,766	92,705	64.1%	74,340	99,205
Total loans	7.3%	24,146	22,522	6.4%	34,386	41,710
N	328			1272		

-Data extracted between Aug 1 2012 and July 31 2013

-Winsorized at 1% upper tail

15. Food security

The baseline questionnaire included three measures of food security designed and tested cross-culturally by the Food and Nutrition Technical Assistance (FANTA) Project, created by U.S. Agency for International Development (USAID) and the Food and Agriculture Organization (FAO) of the United Nations. The three food security measures are Household Hunger Scale, Women's Dietary Diversity Score, and Months of Adequate Household Food Provisioning. Together the indicators provide a comprehensive profile of food security. Multiple measures are necessary, since food security depends at once on adequate availability of food, adequate access to food and appropriate food utilization and consumption.

The Household Hunger Scale (HHS) is the most basic measure of the GAFSP food security indicators. It consists of six questions that measure occurrence and frequency of food insecurity events (such as a household member going to sleep hungry because there was not enough food). It estimates the proportion of households affected by three different severities of household hunger: little to no hunger, moderate hunger, and severe hunger, using a reference period of the previous 12 months. The HHS focuses on the food quantity dimension of food access. It measures food availability and access, but does not measure dietary quality.

The Women's Dietary Diversity Score (WDDS) is an indicator developed by the Food and Agriculture Office (FAO). It is meant to reflect, in a snapshot form, the economic ability of a household to access a variety of foods. Individual dietary diversity scores aim to reflect nutrient adequacy, as the evidence shows that an increase in individual dietary diversity score is related to increased nutrient adequacy of the diet. The WDDS is an aggregate of nine food groups with important micronutrients. Although there is no internationally recognized benchmark, a low WDDS is proven internationally to be correlated with micronutrient deficiencies such as anemia or low vitamin A. The dietary diversity module was administered to an adult female household member, using a reference period of the previous 24 hours. The respondent was asked about her own food consumption.

The Months of Adequate Household Food Provisioning is a simple indicator of household food access. Respondents are asked if in any months of the past 12, there was not enough food to meet the needs of all household members, and in which months the shortages occurred. The MAHFP is measured on a scale of 0-12, in which 12 means the household met its food needs in all 12 months, and 0 means the household was not able to meet its food needs in any of the 12 months.

15.1.   Household hunger scale

As shown in Table 43, the HHS shows that severe hunger is not prevalent in the sampled areas, and 98% report little to no food shortages.

Table 43. Household Hunger Scale

	Percentage
Household Hunger is little to none	98%
Household Hunger is moderate	2%
Household Hunger is severe	0%
N	1,600

Food insecurity rates are slightly higher for female-headed households.

Table 44. Household Hunger Scale by household head gender

	Female-headed HH	Male-headed HH
Household Hunger is little to none	96%	98%
Household Hunger is moderate	3%	2%
Household Hunger is severe	1%	0%
N	328	1,272

15.2.   Women's dietary diversity

The Women's Dietary Diversity Score (WDDS) is an indicator that measures women's dietary quality over the last 24 hours with recall of food intake the previous day. This module of the questionnaire was asked to the 1599 of the 1600 households that had an adult female household member present to complete the section. Table 45 presents the summary of women's dietary diversity. In eligible households, 40% of women have low dietary diversity, consuming less than 3 food groups per day.

Table 45. Women's dietary diversity[23]

	Total Sample	Examples from sample groups
Lowest dietary diversity (≤ 3 food groups)	39.7%	Staple, Legumes, Other vegetables
Medium dietary diversity (4 - 5 food groups)	55.2%	Staple, Legumes, Dairy, Dark greens, Vita A rich vegetables
High dietary diversity (≥ 6 food groups)	5.2%	Staple, Legumes, Dairy, Dark greens, Vita A rich vegetables, Other vegetables, Meat
N	1599	

Note: With recall of food intake the previous day

Low dietary diversity is most common in the mountain areas.

Table 46. Women's dietary diversity, by region

	Hill	Mountain	Examples from groups
Lowest dietary diversity (< 3 food groups)	35.9%	45.0%	Staple, Legumes, Other vegetables
Medium dietary diversity (4 - 5 food groups)	57.6%	51.7%	Staple, Legumes, Dairy, Dark greens, Vita A rich vegetables
High dietary diversity (< 6 food groups)	6.5%	3.3%	Staple, Legumes, Dairy, Dark greens, Vita A rich vegetables, Other vegetables, Meat
N	939	660	

Note: With recall of food intake the previous day

Table 47. Women's dietary diversity, by household head gender

	Female-headed HH	Male-headed HH	Examples from groups
Lowest dietary diversity (< 3 food groups)	40.2%	39.5%	Staple, Legumes, Other vegetables
Medium dietary diversity (4 - 5 food groups)	54.9%	55.2%	Staple, Legumes, Dairy, Dark greens, Vita A rich vegetables
High dietary diversity (< 6 food groups)	4.9%	5.3%	Staple, Legumes, Dairy, Dark greens, Vita A rich vegetables, Other vegetables, Meat
N	328	1271	

Note: With recall of food intake the previous day

Most of these women consume only staples and legumes, with little animal protein or vitamin-rich vegetables.

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[23] Sample limited to households with adult female members

Figure 34. Adult Women Food Group Consumption[24]

Staples — 100%
Legumes — 79%
Other vege — 75%
Dairy — 51%
Dark greens — 34%
Vita A vege — 30%
Meat — 9%
Eggs — 2%
Organ — 1%
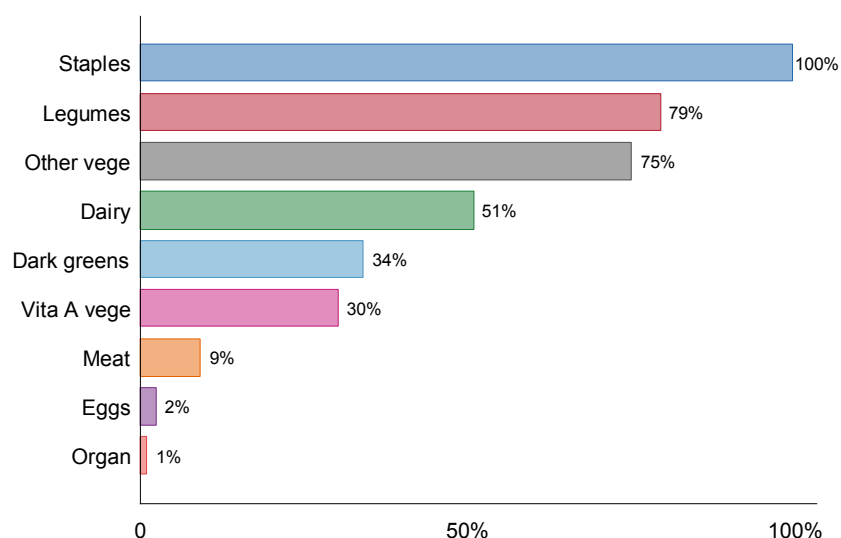
Figure 35 presents women's dietary intakes on vitamin A and iron. 78% of the households with adult women have taken vitamin A rich food groups and 9% of them have taken iron rich food groups. Level of vitamin A intake measures women's consumption of vitamin A rich vegetables or tubers, dark green leafy vegetable, vitamin A rich fruits, organ meat, eggs and milk products; whereas level of iron intake defines as women's consumption level of organ meat, flesh meat, fish and seafood.

Figure 35. Women dietary diversity on vitamin A and iron intake[25]

Vitamin A intake — 78%
Iron intake — 9%

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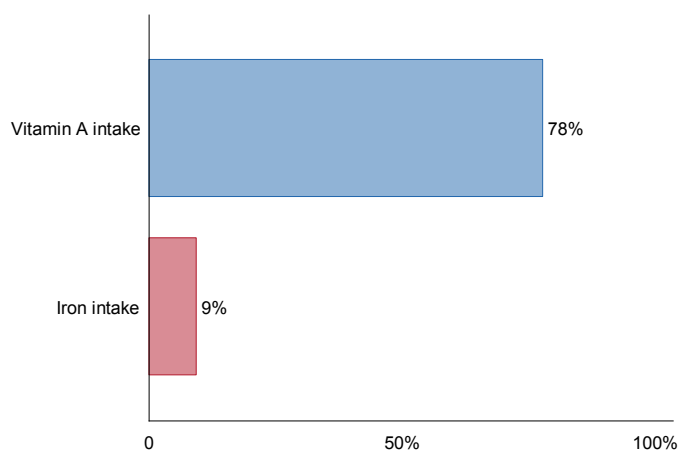
[24] With recall of food intake the previous day
[25] Sample limited to households with adult female members.

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Table 48 looks at the dietary intake of nursing and pregnant women. Only 56.5% of the women who are pregnant or nursing consumed any animal protein[26], and micronutrient rich vegetables or fruits[27]. Women in hill areas have a higher consumption of animal protein, and micronutrient rich vegetables and fruits.

Table 48. Dietary intake of pregnant and nursing women, by region

	Hill	Mountain
Women consumed animal proteins	60.4%	51.6%
Women consumed micronutrient rich vegetables & fruits	64.1%	48.4%
N	813	639

Note: With recall of food intake the previous day

15.3.   Months of Adequate Household Food Provisioning (MAHFP)

38% of households reported no shortages of food in the past year. For the sample as a whole, the Months of Adequate Household Food Provisioning (MAHFP) score was 10.87 out of 12. For the 62% of the sample reporting food shortages, MAHFP score was 9.02.

The most common months for households to suffer food insecurity were Chaitra 2069 (Mar 15 – Apr 15, 2013), where 61% of the total sample reported inadequate food, Shrawan 2070 (Jul 15 – Aug 15, 2013) 40%, and Falgun 2069 (Feb 15 – Mar 15, 2013) and Baisakh 2070 (Apr 15- May 15, 2013) with 34% each period. The best performing month is Kartik 2069 (Sep 15 – Oct 15, 2012) when only 3.6% of the total households reported inadequate food provisions.

Households classified as food insecure by the HHS were much more likely to than average to have had inadequate months of food.

Table 49. MAHFP Score by HHS

	Mean MAHFP Score	N
Household Hunger is little to none	10.82	1565
Household Hunger is moderate	8.72	32
Household Hunger is severe	6.00	3
N		1600

15.4.   Children's dietary intake

Child feeding quality is measured using the WHO's standard infant and young child feeding (IYCF) indicators. The indicators include 8 core indicators and 7 optional indicators, which are presented in Table 51 and

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[26] This consists of the following food groups: animal organs, meat, eggs and dairy.
[27] Consists of the food group categories of: vitamin rich fruits, yellow/orange vegetables and tubers, dark green leafy vegetables.

Table 52. Detailed explanation of the indicators is presented in *Indicators for accessing infant and young child feeding practice* report[28]. These indicators are calculated for all households with children under 2 years old. Consistent with the high level of malnutrition in Nepal, many indicators of child feeding are quite low. Fewer than 50% of children ages 6-23 months meet the standard minimum 3 IYCF practices[29] for adequate nutrition. However, compared with the Nepal DHS taken in 2011, the indicators are far improved. Notably, the amount of children with adequate dietary diversity in our sample is 47%, compared to around 24% in the mid-western and far western regions in the DHS. This might be because this sample does not include the Terai, which generally has lower nutritional indicators.

Table 50. Households with Children of Various Ages

Children under 24 months	75.5%
Children between 20 to 23 months	11.6%
Children between 12 to 15 months	12.4%
Children between 6 to 23 months	56.0%
Children between 6 to 8 months	11.0%
Children under 6 months	19.5%
N	1600

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[28] World Health Organization, *Indicators for accessing infant and young child feeding practice, Part 1. Definitions.,* Washington D.C. Nov 2007.
http://whqlibdoc.who.int/publications/2008/9789241596664_eng.pdf?ua=1
[29] The 3 IYCF practice are: (1) Proportion of children 6-23 months fed with breast milk, milk or milk products; (2) Proportion of children 6-23 months received foods from 4 or more categories; (3) Proportion of children 6-23 months received foods at minimal frequency.

Table 51. Results framework indicators of AFSP -Dietary intake, by region

	Hill districts		Mountain districts		Sample
	Count	Percentage	Count	Percentage	N
Children under 24 months					
Early initiation of breastfeeding (<24m)	684	62.0%	524	55.3%	1208
Exclusively breastfed (<6m)	191	73.8%	121	66.9%	312
Continued breastfeeding at 1 year(12-15m)	114	100.0%	85	100.0%	199
Introduction of solid or soft foods (6-8m)	104	88.2%	72	84.6%	176
Minimum dietary diversity (6-23m)	493	47.1%	403	46.9%	896
Minimum meal frequency (6-23m)	493	84.2%	403	79.9%	896
Minimum acceptable diet-breastfed (6-23m)	493	43.6%	403	39.7%	896
Consumption of iron-rich foods(6-23m)	493	12.2%	403	5.2%	896
Children ever breastfed(<24m)	684	99.9%	524	100.0%	1208
Children continued breastfed at 2 year (20-23m)	103	93.2%	82	97.6%	185
Children age-appropriate breastfeeding (<24m)	684	70.8%	524	76.5%	1208
Children predominant breastfeeding (<6m)	191	80.6%	121	75.2%	312
Children bottlefeeding (<24m)	684	4.5%	524	2.3%	1208
Milk feeding frequency for non-breastfed children (6-23m)	10	70.0%	2	100.0%	12
Breastmilk milk or milk products (6-23m)	493	99.6%	403	100.0%	896
Percentage of children having 3 IYCF practices	493	43.4%	403	39.7%	896
Sample median duration (months) of exclusive breastfeeding (<24 m)					5.943

Table 52. Results framework indicators of AFSP -Dietary intake, by household head gender

	Female-headed HH		Male-headed HH		Sample
	Count	Percentage	Count	Percentage	N
Children under 24 months					
Early initiation of breastfeeding (<24m)	247	57.5%	961	59.5%	1208
Exclusively breastfed (<6m)	60	71.7%	252	71.0%	312
Continued breastfeeding at 1 year(12-15m)	50	100.0%	149	100.0%	199
Introduction of solid or soft foods (6-8m)	37	86.5%	139	83.5%	176
Minimum dietary diversity (6-23m)	187	43.3%	709	48.0%	896
Minimum meal frequency (6-23m)	187	84.0%	709	87.0%	896
Minimum acceptable diet-breastfed (6-23m)	187	38.5%	709	42.7%	896
Consumption of iron-rich foods(6-23m)	187	10.7%	709	8.6%	896
Children ever breastfed(<24m)	247	100.0%	961	99.9%	1208
Children continued breastfed at 2 year (20-23m)	31	96.8%	154	94.8%	185
Children age-appropriate breastfeeding (<24m)	247	74.9%	961	72.8%	1208
Children predominant breastfeeding (<6m)	60	78.3%	252	78.6%	312
Children bottlefeeding (<24m)	247	3.2%	961	3.6%	1208
Milk feeding frequency for non-breastfed children (6-23m)	2	100.0%	10	70.0%	12
Breastmilk milk or milk products (6-23m)	187	100.0%	709	99.7%	896
Percentage of children having 3 IYCF practices	187	38.5%	709	42.7%	896
Sample median duration (months) of exclusive breastfeeding (<24 m)					5.943

15.5.   Kitchen garden

More than 80% of total households have a kitchen garden. The majority of the households use the kitchen garden for self-consumption only. 44.4% of the total households used kitchen gardens to grow chili, 35.1% to grow pumpkin or zucchini, 27.0% to grow green bean (simi), and 21.5% cucumber. It appears that most households use kitchen gardens to grow vegetables.

Table 53. Kitchen garden

	Female-headed	Male-headed	Total
HH has a kitchen garden	82.3%	83.9%	83.6%
Crops grown for self-consumption	81.7%	83.9%	83.4%
N	328	1272	1600

Appendix 1: Crop Prices

Crop	Frequency Harvested	Frequency Sold	Price Assigned (Nrs/Kg)	Crop	Frequency Harvested	Frequency Sold	Price Assigned (Nrs/Kg)
Wheat	5294	70	21	Early Paddy	40	0	20
Summer Maize	3208	10	16	Banana	36	20	22
Main Paddy	2974	3	20	Green leaves	34	11	57
Soyabean	1802	0	80	Pindalu	30	1	46
Beans	1689	19	49	Ginger	29	0	107
Millet	1177	3	16	Groundnut	27	0	49
Mustard	1011	7	62	Turmeric	25	0	107
Barley	863	6	23	Redgram	23	0	49
Blackgram	843	1	139	Mango	20	7	13
Pea	663	12	40	Sugarcane	17	0	0
Upland Paddy	474	0	20	Other oilseed	15	0	57
Lentil	428	13	38	Green garlic	14	4	59
Winter potato	399	107	23	Egg plant	10	5	51
Other Crops	361	3	0	Coriander Seed	10	4	107
Summer Potato	263	15	23	Guava	9	0	0
Spring/Winter maize	158	1	12	Lemon/Lime	8	2	61
Other	141	33	16	Other cash crop	8	0	0
Pumpkin/Zukini	132	2	86	Okra/ Lady finger	6	2	16
Buckwheat	104	0	21	Linseed	6	0	107
Coarse Gram	97	0	49	Bitter ground	3	2	44
Gram	92	12	49	Other trees	3	1	34
Chili	78	10	121	Other spices	3	0	0
Cucumber	74	13	22	Bottle ground	2	1	16
Others Beans	61	0	49	Capsicum	2	1	22
Cabbage	56	32	19	Green Gram	2	0	49
Sesame	52	0	57	Cardamom	2	0	0
Cauliflower	50	31	32	Fodder tree	2	0	0
Tomato	47	22	51	Papaya	2	0	0
Orange	44	9	68	Thatch	1	1	3
Apple	43	10	20	Carrot	1	1	54
Garlic (dry)	42	7	57	Grass pea	1	0	49
Onion (green)	40	17	32	Sweet potato	1	0	0
Onion (dry)	40	12	28	Other Tubers	1	0	0
				Tobacco	1	0	0

Appendix 2: Selected Indicators Requested By FAO

This appendix shows a number of additional specific indicators requested by the Food and Agricultural Organization of the United Nations (FAO) working with the AFSP team.

Table 54: Agriculture Indicators

Agrictulture - Indicator	Baseline Value (%)
% of HHs that use at least one improved/HYV variety of major crop out of those that grow a major crop	30.0%
% of Area cultivated under improved/HYV by major crop	Rice: 18.1% per HH, (21.4% all HH's plot area aggregated) Maize: 22.3% per HH, (29.1% all HH's plot area aggregated) Wheat: 11.6% per HH, (11.4% all HH's plot area aggregated) Potato: 19.9% per HH, (21.1% all HH's plot area aggregated)
% out of HHs growing the major crop that only used non-HYV seeds or only used HYV, by major crop. Calculated for households that cultivated the specific crop.	Rice: 78.8% no HYV, 14.2% only HYV; Maize: 75.9% no HYV, 19.9% only HYV; Wheat: 87.0% no HYV, 10.2% only HYV; Potato: 79.8% no HYV, 19.4% only HYV;
% of HHs using Compost or Farm Yard Manure	99.5%
% of HHs using chemical fertilizers	32.9%
Average expenditures on chemical fertilizers per HH *	352 Rupees
% of HHs using bio-pesticide	2.6%
% of HH using irrigation	70.4%
% of HHs having kitchen garden	83.6%
Average Number of Vegetable Crops produced in one Year	4.2

*Note: Major crops are rice, maize, wheat and potato. Values with * are winsorized at upper 1% tail*

Livestock - Indicator	Baseline Value (%)
% of HHs with goat, buffalo, cattle and poultry (all gender and age)	goat: 63.6%, buffalo: 43.0% cattle: 63.1%, poultry: 43.9%
% of HHs with goat and improved breed of goat, full sample and districts focusing on goats (% improved breed conditional on ownership of goat)	63.6% all districts, 6.2% improved all districts 73.2% goat districts, 7.5% improved goat districts
% of HHs with buffalo and improved breed of buffalo full sample and districts focusing on buffalos (% improved breed conditional on ownership of buffalo)	43.0% all districts, 3.5% improved all districts 48.0% buffalo districts, 3.7% improved buffalo districts
% of HHs with cattle and improved breed of cattle, full sample and districts focusing on cattle (% improved breed conditional on ownership of cattle)	63.1% all districts, 1.8% improved all districts 61.4% cattle districts, 1.6% improved cattle districts
% of HHs with poultry and improved breed of poultry, full sample and districts focusing on poultry (% improved breed conditional on ownership of poultry)	43.9% all districts, 3.9% improved all districts 40.4% poultry districts, 6.5% improved poultry districts
Average production of milk for buffalo and cattle (per HH and not per animal)	buffalo milk: 687.0 liters/year cattle milk: 309.5 liters/year
Median price of buffalo and cattle milk	buffalo milk: 40.8 Rupees/liter cattle milk: 29.8 Rupees/liter
Average production of cow milk per animal *	Cattle (all dist) 263.4 liter/animal/year Cattle (cattle dist) 285.8 liter/animal/year
Avergae production of buffalo milk per animal *	Buffalo (all dist) 640.4 liter/animal/year Buffalo (buffalo dist) 649.6 liter/animal/year
% of HHs selling milk or buffalo milk	All HHs in all districts 6.69%, All HHs in cattle/buffalo districts 7.72% HHs with milking cow/cattle in all districts 7.87%, HHs with milking cow/cattle in cow/cattle districts 8.98%,
Average sale per HH of cattle or buffalo milk (liters), conditional on producing milk *	Buffalo, 382.7 L/year Cattle, 312.3 L/year
Average sale per HH of cattle or buffalo milk (rupees), conditional on producing milk *	Buffalo, 16002 rupees/year Cattle, 9825 rupees/year
Average annual egg production (per HH, not per hen)	46.9 eggs per year, all districts 41.4 eggs per year, poultry districts
% of HH using stall feeding practices	84%
% of HH spent money on fodder on at least one of the livestock	17%
% of HH adopting vaccination practices for their animals	9%
% of HH practicing poultry deworming	13%
% of HH practicing dripping/drenching (goat, cattle, buffalo)	21%

*Note: Goat districts are Rolpa, Pyuthan, Salyan, Rukum, Jajarkot, Dailekh, Surkhet, Baitadi, Dadeldhura, Darchula, Achham and Doti. Cattle and buffalo districts are Kalikot, Jumla, Rolpa, Pyuthan, Salyan, Rukum, Jajarkot, Dailekh, Surkhet, Baitadi, Dadeldhura, Darchula, Achham, Bajhang, Bajura and Doti. Poultry district are Jajarkot, Jumla, Kalikot, Bajura, Bajhang, Humla, Mugu and Dolpa. Values with * are winsorized at upper 1% tail*

Table 56: Nutrition Indicators

Nutrition - Indicator	Baseline Value (%)
% of pregnant and nursing women with intake of micro-nutrient rich vegetabels and fruits	57%
% of children with improved IYCF practices	42% (conditional on HH with infants 6-23 months) 56% of HHs has an infant aged between 6 and 24 months
% of infants with exclusive breast feeding	71% (conditional on HH with 6-m infants) 20% of HHs has an infant younger than 6 months
% of children with minimum acceptable diet	41% (conditional on HH with infants 6-23 months)
% of children with minimum meal frequency	86% (conditional on HH with infants 6-23 months)
% of children with minimum dietary diversity	48% (conditional on HH with infact 6-23 months)

Table 57: Types of Irrigation

Types of irrigation	%
Tubewell/Boring	32.3
Flow canal(Kulo)	67.1
Sprinkler irrigation	12.7
Well	6.5
Water harvesting tank	3.3
Furrow irrigation	4.9
Plastic pond	1.0
N	1600