





## ACRONYMS

AMIS	:	Agriculture Management Information System
ASC	:	Agriculture Sub Centre
CBO	:	Community Based Organizations
DADO	:	District Agricultural Development Office
DLSO	:	District Livestock Service Office
EWS	:	Early Warning System
FFS	:	Farmers Field School
FGD	:	Focus Group Discussion
HH	:	Household
INGO	:	International Non-Government Organization
KII	:	Key Informants Interview
LSC	:	Livestock Service Centre
MoAD	:	Ministry of Agriculture Development
msl	:	Mean sea level
NARC	:	Nepal Agricultural Research Council
NGO	:	Non-Government Organization
TV	:	Television
VDC	:	Village Development Committee
WUG	:	Water User's Group

**Contents**

CHAPTER I: INTRODUCTION .....	5
1.1 General Information (Background) .....	5
1.2 Land Utilization.....	5
1.3 Climate .....	6
CHAPTER II: DEMOGRAPHIC AND SOCIO-ECONOMIC CHARECTERSTIC.....	7
2.1 Population by age group and sex .....	7
2.2 Household head and members .....	8
2.3 Marital Status of head of households.....	8
2.4 Educational status, distance and time spent for schooling.....	9
2.5 Accessibility to educational institutions in terms of distance and time spent.....	9
2.6 Occupation.....	10
2.7 Migration .....	11
2.8 Alignment of HH members with institutions.....	11
2.9 Ethnicity .....	11
2.10 Housing Ownership .....	12
2.11 Households asset .....	12
2.12 Food security status .....	13
2.13 Source of Energy .....	13
2.14 Source of Drinking water .....	14
2.15 Toilet facility .....	14
2.16 Households consulting health institutions .....	15
2.17 Households income and expenditure .....	15
2.18 Credit Situation.....	16
2.19 Agricultural insurance for protecting risks on crops and livestock .....	16
2.20 Source of information.....	17
CHAPTER III: AGRICULTURE PRODUCTION AND PRODUCTIVITY .....	19
3.1 Land Holding.....	19
3.2 Use of Land by Type .....	19
3.5 Use of improved seeds.....	21
3.6 Marketing of farm product .....	21
3.7 Use of chemical fertilizers and pesticides .....	22
3.8 Sources of fertilizers/pesticides .....	23
3.10 Livestock production .....	24
3.12 Livestock housing and feeding .....	24
3.13 Milk and milk products .....	25
3.14 Feeds and feeding .....	25
3.15 Poultry .....	26
3.16 Fishery.....	27
3.17 Forest.....	27
CHAPTER IV: CLIMATE CHANGE, AGRO-ADVISORY & AGRO-MET ADVISORY .....	28

4.1 Climatic hazards, their occurrence and support..... 28

4.2 Experience on different types climatic extremes in different seasons ..... 29

4.3 Early warning messages ..... 30

    4.3.1 Perception about the need of types of communication media for early warning ..... 30

    4.3.2 Accessibility to agricultural advice and sources ..... 31

    4.3.4 Communication and media for agricultural program..... 31

Annex 1 ..... 32

## CHAPTER I: INTRODUCTION

### 1.1 General Information (Background)

Palpa is one of the mountain district of 25 pilot districts of Building Resilience to Climate Related Hazards Project (BRCH), situated in Lumbini zone of Western Development Region (WDR). The district is located in the latitude of 27° 34' to 27° 57'N and the longitude of 83° 15' to 84° 22' E (Figure 1).The district administrates 65 Village Development Committees (VDCs) and 1municipality. It borders with Nawalparasi district at east, Gulmi and Arghakhanchi districts at west, Syangja and Tanahu district at north, and the Rupandehi and Nawalparasi districts at the south. Tansen is the district headquarters.

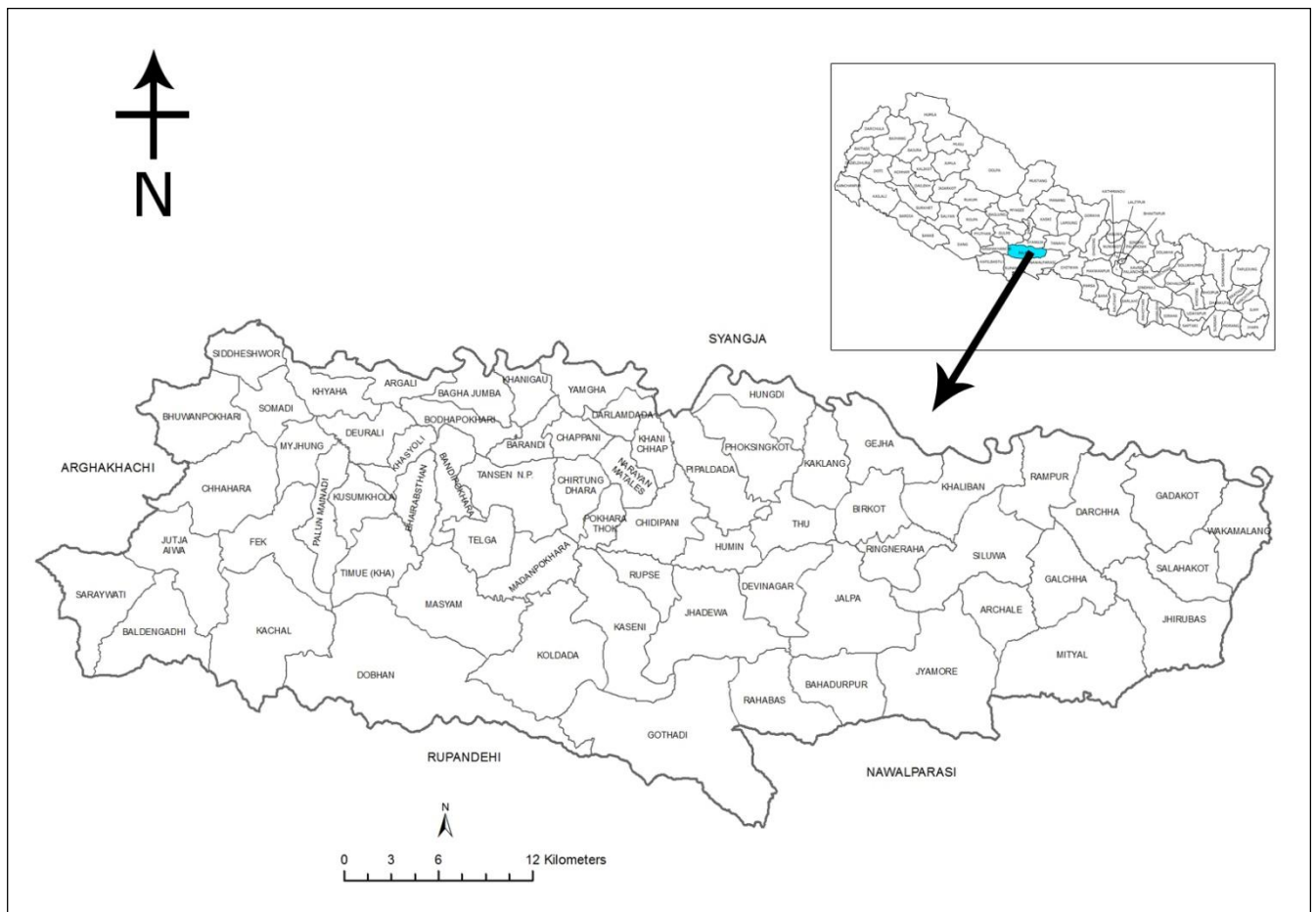


Figure 1: Location Map of Palpa District

The topography of the district is almost same as other hilly districts. It lies on the lap of Mahabharata Hill. The elevation begins at 157 msl to the 1936 msl.

### 1.2 Land Utilization

The area of the district is (1373 km<sup>2</sup>) 1366 km<sup>2</sup>(136595 ha) and there are 65 Village Development Committees (VDCs) and one Municipality. The total cultivable area of the district

is 57172 ha out of which 36,567 ha is cultivated. Khet land is 8750 ha and 27817 ha is bari (upland) where mainly maize based cropping system is followed (DADO, 2014). The district has 53,908 ha forest area, 24,262 ha pasture/bushy land, and others area of 1253 ha. The total cultivated land was , irrigated land constituted 8,710 ha. Altogether, there are 44,406 HH with 28,325 rural HHs and 6,290 urban HHs, which excludes the institutional HH.

### 1.3 Climate

Diverse type of climate is found in Palpa district. Its climate can be divided into two i.e. subtropical climate found in chure regions and river basins and temperate climate found in other hilly areas. The average annual rainfall is 1903 mm. Eighty percent rainfall mainly occurs during monsoon (Jestha to Bhadra) and 20% in other months. Average maximum temperature is 23°C and minimum temperature is 14°C. The climate records of the district is presented in Annex 1.

## CHAPTER II: DEMOGRAPHIC AND SOCIO-ECONOMIC CHARACTERISTIC

This section focuses on the demographic and socio-economic characteristic like age and sex distribution of the HH heads, literacy and education, marital status, occupation, ethnicity, migration, ownership of the HH, sources of energy, toilet and health institution, income and expenditure, capital information, insurance etc.

**Table 1.1: Summary statistics of demographic and other household characteristics**

Description	CBS, 2011	Base line survey, 2015
Sex ratio (number of males per 100 females)	89.4	112.17
Dependency ratio	.....	48.01
Household(HH) size	4.41	5.02
Percent of female headed households	40.66	15.46
HH (%) who own their housing unit	87.24	99.53
HH (%) with piped drinking water	77.30	86.33
HH (%) with access to electricity	72.98	92.86
HH (%) with access to Telephone/Mobile	79.38	88.33
HH (%) with toilet	76.30	99.76
HH (%) using firewood for cooking	80.44	83.12
Literacy rate	76.8	62.39

### 2.1 Population by age group and sex

The male population of 52.87 percent is lower than 47.13 percent of female population giving sex ratio of 112.17 in the district. About 20.44 percent of population were under 15 years and 12.00 percent were of 60 years or more old. Thus majority of population (67.56 %) were from age group 15-59 years (Table 1.2). The survey data revealed that the overall dependency ratio is 48.01 percent. The average household size of the district is found to be 5.02 compared to 4.41 as of 2011 census.

**Table 1.2: Distribution of population by age and sex**

Age Group	Gender				Total	
	Male		Female		Total	
	No.	%	No.	%	No.	%
1-4 Years	7192	2.42	6342	2.13	13534	4.55
5-9 Years	9595	3.23	8606	2.89	18201	6.12
10-14 Years	15101	5.08	13967	4.69	29068	9.77
15-19 Years	16933	5.69	15098	5.07	32031	10.77
20-24 Years	17356	5.83	17214	5.79	34570	11.62
25-29 Years	14391	4.84	12413	4.17	26804	9.01
30-34 Years	11847	3.98	10295	3.46	22142	7.44
35-39 Years	12275	4.13	10440	3.51	22715	7.63
40-44 Years	9598	3.23	9589	3.22	19187	6.45
45-49 Years	8176	2.75	7618	2.56	15794	5.31
50-54 Years	8746	2.94	7895	2.65	16641	5.59
55-59 Years	6060	2.04	5076	1.71	11136	3.74
60-64 Years	6066	2.04	6064	2.04	12130	4.08
65+Years	13965	4.69	9595	3.23	23560	7.92
<b>Total</b>	<b>157301</b>	<b>52.87</b>	<b>140212</b>	<b>47.13</b>	<b>297513</b>	<b>100.0</b>



Source: Annex Table 1

## 2.2 Household head and members

Son/daughter constituted largest percentage (38.13%) of household members followed by household heads which constituted 19.91 percent of the population (Table 1.3).

**Table 1.3: Percentage of population by relation to HH head and gender**

Relation to HH Head	Gender				Total	
	Male		Female		Total	
	No.	%	No.	%	No.	%
Head	50085	16.83	9174	3.08	59259	19.91
Husband/wife	2964	1.00	43594	14.65	46558	15.65
Son/daughter	79592	26.75	33856	11.38	113448	38.13
Grand children	20038	6.73	17495	5.88	37533	12.61
Son/daughter in law	2254	0.76	32731	11.00	34985	11.76
Daughter/son in law	141	0.05	282	0.09	423	0.14
Parent	987	0.33	1833	0.62	2820	0.95
Father/mother in law	-	-	-	-	-	-
Brother/sister in law	846	0.28	704	0.24	1550	0.52
Household widow	-	-	-	-	-	-
Others	421	0.14	565	0.19	986	0.33
<b>Total</b>	<b>157328</b>	<b>52.87</b>	<b>140234</b>	<b>47.13</b>	<b>297562</b>	<b>100.00</b>

Source: Annex Table 2

Out of 19.91 percent household heads, female formed 3.08 percent of heads in comparison to 16.83 percent of male members who were household heads, thus giving overall female household head percentage as 15.46 percent.

## 2.3 Marital Status of head of households

A total of 63.38 percent of household members were married. Widow members of the household constituted 3.18 percent of the population. A total of 19.38 percent of population were unmarried male whereas unmarried female population accounted for 13.59 percent of total population.

**Table 1.4: Population by marital status and gender in pilot districts**

Marital Status	Gender				Total	
	Male		Female		Total	
	Number	%	Number	%	Number	%
Married	85651	32.22	82829	31.16	168480	63.38
Divorced	423	0.16	281	0.11	704	0.26
Separate	423	0.16	141	0.05	564	0.21
Widow/widower	2536	0.95	5922	2.23	8458	3.18
Unmarried	51506	19.38	36118	13.59	87624	32.96
<b>Total</b>	<b>140539</b>	<b>52.87</b>	<b>125291</b>	<b>47.13</b>	<b>265830</b>	<b>100.00</b>

Source: Annex Table 3

Female gender had higher percentage of widow (2.23%) than male gender (0.95%).

## 2.4 Educational status, distance and time spent for schooling

The literacy rate of the district of age 5 and above is found to be 62.39 percent compared to 76.8 percent in 2011 census showing that the literacy rate has been decreased over the period of time. As regards to the educational status, the share of who can read and write (27.88%), was high followed by secondary (13.31%) and primary (13.02%).

**Table 1.5 Percentage of population by education level and gender**

Education Level	Gender				Total	
	Male		Female			
	No.	%	No.	%	No.	%
Cannot read and write	17906	6.30	9731	3.43	27637	9.73
Can read and write	37120	13.07	42049	14.81	79169	27.88
Beginners	1693	0.60	1408	0.50	3101	1.09
Primary (1-5)	18207	6.41	18765	6.61	36972	13.02
L. Secondary (6-8)	18624	6.56	16792	5.91	35416	12.47
Secondary (9-10)	19473	6.86	18337	6.46	37810	13.31
SLC/Equivalent	7472	2.63	6487	2.28	13959	4.92
Inter/Equivalent	16226	5.71	12979	4.57	29205	10.28
Grad/Equivalent	10302	3.63	6061	2.13	16363	5.76
PG/Equi/above	3102	1.09	1268	0.45	4370	1.54
<b>Total</b>	<b>150125</b>	<b>52.86</b>	<b>133877</b>	<b>47.14</b>	<b>284002</b>	<b>100.00</b>

Source: Annex Table 4

## 2.5 Accessibility to educational institutions in terms of distance and time spent

Currently 26.99 percent of the family members of age 5 and above are going to educational institutions. Proportion of them is higher in case of male (13.77 %) than female (13.22%).

**Table 1.6: Population by going to school (>5 years)**

Going to School	Gender				Total	
	Male		Female			
	No.	%	No.	%	No.	%
Yes	39093	13.77	37539	13.22	76632	26.99
No	111051	39.12	96223	33.89	207274	73.01
<b>Total</b>	<b>150144</b>	<b>52.89</b>	<b>133762</b>	<b>47.11</b>	<b>283906</b>	<b>100.00</b>

Source: Annex Table 5

As regards to the accessibility to educational institutions in terms of distance, 93.93 percent of the population have reported that distance to reach is less than 1 km, whereas 1.47 percent reported distance of 1-5 km (Table 1.7).

**Table 1.7 Population by distance to education institution (>5 years)**

Distance	Gender				Total	
	Male		Female			
	No.	%	No.	%	No.	%
Less than 1km	35991	46.97	35984	46.96	71975	93.93
1-5 km	985	1.29	141	0.18	1126	1.47
5-10 km	563	0.73	141	0.18	704	0.92
Greater than 10 km	1552	2.03	1271	1.66	2823	3.68
<b>Total</b>	<b>39091</b>	<b>51.01</b>	<b>37537</b>	<b>48.99</b>	<b>76628</b>	<b>100.00</b>

Source: Annex Table 6

Accessibility to educational institution by gender shows that that 95.22 percent of the households have reported that institutions can be reached within one hour (Table 1.8).

**Table 1.8 Population by time taken to education institution (>5 years)**

Time taken	Gender				Total	
	Male		Female			
	No.	%	No.	%	No.	%
Less than 1 hour	36695	47.89	36266	47.33	72961	95.22
1-2 hours	1268	1.65	705	0.92	1973	2.57
More than 2 hours	1128	1.47	565	0.74	1693	2.21
<b>Total</b>	<b>39091</b>	<b>51.01</b>	<b>37536</b>	<b>48.99</b>	<b>76627</b>	<b>100.00</b>

Source: Annex Table 7

Regarding mode of transport to educational institutions, large proportion (92.64 %) of the population reported travelling on foot.

**Table 1.9: Population by mode of transportation to education institution (>5 years)**

Mode of transport	Gender				Total	
	Male		Female			
	No.	%	No.	%	No.	%
On foot	35428	90.63	35562	46.41	70990	92.64
Bus	2679	6.85	1410	1.84	4089	5.34
Bicycle	-	-	-	-	-	-
Foot and bus	562	1.44	141	0.18	703	0.92
Other	422	1.08	422	0.55	844	1.10
<b>Total</b>	<b>39091</b>	<b>100.00</b>	<b>37535</b>	<b>48.98</b>	<b>76626</b>	<b>100.00</b>

Source: Annex Table 8

## 2.6 Occupation

A total of 35.89 percent of the population reported their main occupation as agriculture in their own land followed by student (21.93 %), and few segment of the population (1.32%) have reported agriculture in the basis of salary/wage worker. Only 10.83 percent of the population was engaged in external jobs abroad. Occupational pattern is more or less same in case of male and female except in case of external work and salaried non agriculture occupation where female participation is quite low.

**Table 1.10: Distribution of population by types of occupation**

Main Occupation	Gender				Total	
	Male		Female			
	No.	%	No.	%	No.	%
Own agriculture	38944	14.65	56445	21.23	95389	35.89
Salaried/wage agriculture	2396	0.90	1126	0.42	3522	1.32
Non agriculture salary	18613	7.00	5773	2.17	24386	9.17
Own enterprises	8327	3.13	2256	0.85	10583	3.98
Abroad external job	26958	10.14	1831	0.69	28789	10.83
Household work	7761	2.92	15098	5.68	22859	8.60
Student	29920	11.26	28364	10.67	58284	21.93
No work	6345	2.39	14248	5.36	20593	7.75
Other	1267	0.48	141	0.05	1408	0.53
<b>Total</b>	<b>140531</b>	<b>52.87</b>	<b>125282</b>	<b>47.13</b>	<b>265813</b>	<b>100.00</b>

Source: Annex Table 9

## 2.7 Migration

Among the migrated population, family reason is the main reason for migration as has been reported by 2.83 percent of the households, followed by 0.81 percent due to natural disaster.

**Table 1.11 : Reasons of migration of the HH's members**

Reason for Migration	HH	
	No	%
Family reason	2961	2.83
Education/training	563	0.54
Natural disaster	844	0.81
Looking for work	565	0.54
-Easier lifestyle	-	-
No migration	99810	95.29
Other reason		-
<b>Total</b>	<b>104743</b>	<b>100.00</b>

Source: Annex Table 12

## 2.8 Alignment of HH members with institutions

Only 24.36 percent of household members were associated with different institutions. Association with 'other' was reported by 20.12 percent of the population.

**Table 1.12: Members of the households (>=10 years) associated with different institutions**

Types of organizations	Gender				Total	
	Male		Female		No.	%
	No.	%	No.	%		
Farmers Field School	282	0.11	423	0.16	705	0.27
Vegetable	423	0.16	282	0.11	705	0.27
Water Users Group	564	0.21	141	0.05	705	0.27
Commercial Crop Production		0.00		0.00		0.00
Saving credit co-operative	845	0.32	2538	0.95	3383	1.27
Agricultural co-op group	3949	1.49	1550	0.58	5499	2.07
Agriculture marketing	282	0.11	0	0.00	282	0.11
Seed production		0.00		0.00		0.00
Other	44725	16.82	8749	3.29	53474	20.12
Not in Group	89470	33.66	111605	41.98	201075	75.64
<b>Total</b>	<b>140540</b>	<b>52.87</b>	<b>125288</b>	<b>47.13</b>	<b>265828</b>	<b>100.00</b>

Source: Annex Table 10

## 2.9 Ethnicity

The distribution of population by ethnicity revealed that majority of the population residing in the district constituted Brahmin/Chhetri which accounted for 46.90 percent of the total population, followed by Adibasi/Janajati (36.69%). Dalit constituted only 16.41 percent of the population.

**Table 1.13: Distribution of population by ethnicity**

Ethnicity	Gender				Total	
	Male		Female		No.	%
	No.	%	No.	%		

Adibasi/Janajati	54885	18.44	54309	18.25	109194	36.69
Brahman/Chhetri	74503	25.04	65048	21.86	139551	46.90
Dalit	27948	9.39	20888	7.02	48836	16.41
Madhesi	-	-	-	-	-	-
Others	-	-	-	-	-	-
<b>Total</b>	<b>157336</b>	<b>52.87</b>	<b>140245</b>	<b>47.13</b>	<b>297581</b>	<b>100.00</b>

Source :Annex Table11

## 2.10 Housing Ownership

Regarding the ownership of the houses, almost all of the households (99.53%) reported that they have their own houses. Among those, who have owned house, 80.72percent of the HH were found to have lived in Semi-pakki houses and 10.47 percent in cement roof/pakki house.

**Table 1.141: Distribution of ownership of houses by types of houses**

Types of house ownership	HH	
	No.	%
Own house	58980	99.53
Rented house	281	0.47
Relative's house	0	0.00
Land owner's house (included in rented land)	0	0.00
Institutional house	0	0.00
<b>Total</b>	<b>59261</b>	<b>100.00</b>

Source: Annex Table 13

**Table 1.152: Distribution of houses by types of houses**

Type of residential house	HH	
	No.	%
Concrete roof/pakki/cemented	6205	10.47
Semi-pakki (tin/tile/slate roof)	47841	80.72
Kacchi- thatched roof	5223	8.81
Others	0	0.00
<b>Total</b>	<b>59269</b>	<b>100.00</b>

Source: Annex Table 14

## 2.11 Households asset

The most common assets owned by the people are found to be telephones/mobile phones reportedly constituting 42.74 percent of household assets items followed by Radio/cd player, TV, and assets including jewellery constituting 16.99, 15.83, and 14.80 percent of the asset items. An attempt has been made to calculate the salvage value of the assets owned by the HH in the current market value. Expensive assets like jewellery formed largest (57.02%) portion of the net value of the all the assets owned by the households followed by telephone/mobile(9.54 %). Insignificant proportion of the net value was represented by the assets like refrigerators, sewing machine, fan/heater etc.

**Table 1.16: Distribution of different type of assets and their value**

Types of assets	Items		Approximate current value	
	No.	%	(Rs)	%
Radio/ cd player	51496	16.99	32134913	0.47
Cycles	846	0.28	1325610	0.02
Motorcycle/scooter	6205	2.05	552469500	8.10
Car/jeep	564	0.19	564144000	8.27
Bus/truck	-	-	-	-

Telephone/mobile	129521	42.74	651124995	9.54
Washing machine	-	-	-	-
Refrigerator	2260	0.75	4053875	0.06
Sewing machine	564	0.19	2393760	0.04
Fan/heater	3105	1.02	620109	0.01
TV	47974	15.83	542469165	7.95
Assets including Jewelries	44865	14.80	3889482082	57.02
Tractor/power tiller	283	0.09	25425000	0.37
Thresher/pump set/sprayers	-	-	-	-
Mill/Ghatta/turbine	-	-	-	-
Others	15384	5.08	556082030	8.15
<b>Total</b>	<b>303068</b>	<b>100.00</b>	<b>6821725039</b>	<b>100.00</b>

Source: Annex Table 15

## 2.12 Food security status

Sufficiency of food and its security to the farmers from their farm is an important indicator of economic status of the farmers. In this regards, only small segments of the households (7.62 %) have reported that they have food sufficiency for 12 or more months. A total of 18.82 percent of the households have reported that food is sufficient for 9 to 12 months, indicating that about three fourth of the households have food deficiency, i.e. they have to support their family from other sources of income.

**Table 1.173: Food sufficiency of the HH by duration**

Food sufficiency level	HH	
	No.	%
Less than 3 months	17913	30.22
3 to less than 6 months	13266	22.38
6 to less than 9 months	12419	20.95
9 to less than 12 months	11154	18.82
12 months or surplus	4519	7.62
<b>Total</b>	<b>59271</b>	<b>100.00</b>

Source: Annex Table 16

## 2.13 Source of Energy

As regards to the source of energy for lighting, 92.86 percent households have electricity for lighting followed by 3.81 percent who had lighting from solar panels.

Among various sources of energy for cooking, firewood remained main fuel for cooking, accounting for 83.12 percent of the total households. Though majority of the households, have access to electricity, they could not use electricity for cooking due to high cost and prolonged load shedding.

**Table 1.18: Distribution of HH by sources of fuel for lighting and cooking**

Purpose	Main source of energy	HH	
		No.	%
<b>Light</b>	Electricity	55027	92.86
	Biogas	422	0.71
	Solar	2260	3.81
	Kerosene	1271	2.14
	Other	281	0.47
	<b>Total</b>	<b>59261</b>	<b>100.00</b>
<b>Cooking fuel</b>	Timber/ firewood	49257	83.12
	Cow dung cake	141	0.24
	Straw/ dry grass/ eaves/rubbish	141	0.24

	Cylinder gas	7890	13.31
	Biogas	1833	3.09
	Kerosene		0.00
	Other		0.00
	<b>Total</b>	<b>59262</b>	<b>100.00</b>

Source: Annex Table 17 and 18

## 2.14 Source of Drinking water

Source of drinking water refers to the place from where households draw water for drinking and cooking foods for household members. Piped water as a source of drinking water was reported by 85.96 percent of the households followed by 12.15 percent households from spring.

**Table 1.19: Distribution of HH reporting different sources of drinking water**

Source	HH	
	No	%
Piped water	50938	85.96
Covered well	282	0.48
Hand pump/tube-well	421	0.71
Open well	140	0.24
Spring water	7198	12.15
River		0.00
Other	282	0.48
<b>Total</b>	<b>59261</b>	<b>100.00</b>

Source: Annex Table 19

## 2.15 Toilet facility

Almost all of the households (99.76%) have access to toilet indicating wide spread effect of recent campaigns on making districts open defecation free. Majority (75.74%) of the households have reported that they have toilet without flush. Insignificant percentage (3.33%) of people have toilet with flush connected to sewer.

**Table 1.20: Distribution of HH using different type of toilets**

Types of toilet used	HH	
	No.	%
Toilet with flush (connected to sewer)	1975	3.33
Toilet with flush (connected to safety tank)	12121	20.45
Toilet without flush	44886	75.74
Public toilet	140	0.24
No toilet	141	0.24
<b>Total</b>	<b>59263</b>	<b>100.00</b>

Source: Annex Table 20

## 2.16 Households consulting health institutions

Among various kinds of health institutions in the district, government health post/primary health center cater substantial percentage of households (48.82%), which is followed by private hospitals (20.46%) and government district hospital (6.19%).

**Table 1.21: Distribution of HH consulting different health institutions**

Health service provider	HH	
	No.	%
Government health post/PHC	28935	48.82
Government district hospital	3670	6.19
Government mobile clinic		0.00
Government Ayurveda center		0.00
Government other institution		0.00
Private hospital	12125	20.46
Private pharmacy/clinic	846	1.43
Private health worker's home	141	0.24
Private others	13549	22.86
<b>Total</b>	<b>59266</b>	<b>100.00</b>

Source: Annex Table 21

## 2.17 Households income and expenditure

The survey result showed that food constituted highest part of expenditure with 50.35 percent followed by 16.39 percent expenses on education and 9.19 percent on apparel and personal items.

**Table 1.22: Expenditure distribution of HH by different items**

Items of expenditure	HH (No).	Total expenditure		Average expenditure/ HH (Rs)
		Rs	%	
Food	58557	3911913100	50.35	66805
Fuel	27095	169818465	2.19	6268
Apparel and personal items	57144	714080985	9.19	12496
Social and religious activities/donation/charity	22439	122370231	1.58	5453
Insurances and taxes	3527	21306815	0.27	6041
Repair and maintenance of house, vehicles, equipment	4797	52767580	0.68	11000
Transportation	54747	306702224	3.95	5602
Newspaper/communication	33017	66457096.32	0.86	2013
Disaster related expenses	1411	11128360	0.14	7887
Input cost for agriculture/livestock/other enterprises	35699	504977011	6.50	14145
Health	43880	604634460	7.78	13779
Education	40780	1273367870	16.39	31225
Cash losses	283	9887500	0.13	34938
Other	-	-	-	-
<b>Total</b>	<b>n=59259</b>	<b>7769411697</b>	<b>100.00</b>	<b>131109</b>

Source: Annex Table 22

As regards to the income of the HH in the district, remittances was found to be major contributor to total annual income, which accounted for 36.91 percent followed by non-agricultural wage and salary which



contributed 32.85 percent. Combining the income from different heading as given in the following table the average income is found to be Rs 2, 57, 682.

**Table 1.334: Income distribution of HH by different sources**

Major source of household income	HH (No.)	Total income		Average income/HH (Rs)
		Rs	%	
Agricultural wages/labor	6491	410731500	10.95	63276
Nonagricultural wages/salary	19465	4221697440	32.85	216890
Sale of agricultural products	9036	575904525	15.25	63736
Livestock/fisheries sale	8608	291994800	14.53	33923
Milk and milk product sale	2681	133679225	4.52	49870
Remittances	21870	6309460350	36.91	288496
Occupational work (tailoring, black	1835	443311000	3.10	241563
Forestry related products sale	-	-	-	-
Pension	5078	697717280	8.57	137413
Own enterprise	9175	1606481300	15.48	175097
Others	3104	579000930	5.24	186516
<b>Total</b>	<b>n=59259</b>	<b>15269978350</b>	<b>147.39</b>	<b>257682</b>

Source: Annex Table 23

From the analysis of income and expenditure, it can be concluded that on an average there is a per annum surplus of income by Rs1, 26, 573 per household.

### 2.18 Credit Situation

Credit is one of the important economic indicators, which is taken either to sustain the present status of life or to invest on something else in order to take benefit from the investment. In this regards, a total of 12.14 percent of households have taken loan during the last 12 months.

**Table 1.24: Frequency and percentage of HH taking loan**

Loan taken	HH	
	No.	%
Yes	7195	12.14
No	52071	87.86
<b>Total</b>	<b>59266</b>	<b>100.00</b>

Source: Annex Table 24

### 2.19 Agricultural insurance for protecting risks on crops and livestock

It is evident that climate change is becoming alarming to the survival and there is a growing threat of climate and weather related risks on crop and livestock. A total of 45.95 percent of the households have reported that there is presence of climate and weather related risks on crops and livestock production.

**Table 1.25: Distribution of HH reporting presence of climatic and weather related risks**

Possibility of risks on crop/livestock	HH	
	No.	%
Yes	27236	45.95
No	32033	54.05
<b>Total</b>	<b>59269</b>	<b>100.00</b>

Source: Annex Table 25

Among the households reporting presence of climate and weather related risks, majority of households reported the risk of diseases and pests in all the crops. Similarly drought was reported by 33.32, 34.96, and 66.15 percent households as risk on rice, wheat, and maize respectively. Risk of flood on rice and potato was reported by 1.90 and 9.95 percent households while risks due to hailstone on rice, wheat, and maize was reported by 3.81, 10.01, and 4.04 percent of the households.

**Table 1.26: Distribution of HH reporting high risks in various crops/livestock**

Crop/livestock	HH (%)					
	Disease pest	Drought	Flood	Hail stone	All	Others
Rice	60.01	33.32	1.90	3.81	0.00	0.95
Wheat	55.02	34.96	-	10.01	0.00	0.00
Maize	28.28	66.15	-	4.04	0.51	1.01
Mustard	69.21	30.79	-	-	-	-
Vegetable	47.08	43.12	5.88	3.93	-	-
Potato	70.08	19.97	9.95	-	-	-
Cow	100	-	-	-	-	-
Buffalo	100	-	-	-	-	-
Sheep	-	-	-	-	-	-
Goat	100	-	-	-	-	-
Chyangra	-	-	-	-	-	-
Chicken	100	-	-	-	-	-
Duck	-	-	-	-	-	-
Other	50.00	-	-	-	50.00	-
Total	43.99	49.38	1.47	3.94	0.49	0.74

Source: Annex Table 26 (Figures in the above table is multiple answer does not match with 100%)

Regarding the risk on livestock species, all species were reported to be vulnerable to risks of diseases and pests.

An enquiry into the knowledge on insurance companies and schemes, 4.76 percent of the households are found to have known about crop insurance but none of the households had insured the crops.

**Table 1.27: Frequency and percentage of households having knowledge of insurance**

Knowledge on crop/ livestock insurance	HH	
	No.	%
Yes	2822	4.76
No	56440	95.24
<b>Total</b>	<b>59262</b>	<b>100.00</b>

Source: Annex Table 27

## 2.20 Source of information

Insurance agents were sole source of information on agriculture insurance was reported by 100 percent of the households.

**Table 1.29: Households reporting source of information on agricultural insurance**

Source	HH	
	No.	%
Insurance agent	282	100
DADOs/DLSOs	-	-
Newspaper	-	-
TV/Radio	-	-

ASCs/LSCs	-	-
Leader farmer/Neighbor/Relatives	-	-
Other	-	-
<b>Total</b>	<b>282</b>	<b>100</b>

Source: Annex Table 32

Out of 2258 households, only 1693 (74.98%) reported having knowledge about 75 percent subsidy on agriculture insurance.

**Table 1.30: Distribution of households reporting 75% subsidy on agricultural insurance premium**

<b>Response</b>	<b>No.</b>	<b>%</b>
Yes	1693	74.98
No	565	25.02
<b>Total</b>	<b>2258</b>	<b>100.00</b>

Source: Annex Table 33

## CHAPTER III: AGRICULTURE PRODUCTION AND PRODUCTIVITY

As majority of the population rely on agriculture for their livelihood, land holding is common and integral part of life. In this context, this chapter focuses on land holding, land use by type, cropped area with cropping patterns, crop production, marketing of farm product, livestock, poultries and fisheries, milk and milk product.

### 3.1 Land Holding

In this regards, almost all the households (97.38%) in the district have owned their land.

### 3.2 Use of Land by Type

Temporary crop was grown with average area of 0.138 ha/HH and overall irrigated land is 0.0138 ha/HH with average number of parcel land is 1.98. Average area of land used for temporary fallow was 0.0002 ha/HH. Use of temporary graze land was reported by 8411 households. The use of land for permanent crops is reported to be 0.2846 ha/HH. The land use for permanent meadow is 0.0011 ha/HH. Similarly, the average area for forest by the HH was found to be 0.0137 ha/HH.

**Table 2.15: Distribution of HH using land by type**

Type of land	No. of HH	Ave. area (ha)	Ave. no. of parcel	Ave. irrigated (ha)
Temporary crop	50786	.1388	1.98	0.0138
Temporary graze land	8411	.0001	1.00	-
Temporary fallow	8475	.0008	2.00	0.0002
Permanent crops	59261	.2846	1.67	0.0687
Permanent graze land	59261	.0087	1.50	0.0011
Appropriate for forest	31011	.0137	1.11	-
Appropriate for fishery	-	-	-	-

Source: Annex Table 34

### 3.3 Source of Irrigation

Out of 3674 respondents, who have managed to irrigate in their field with different sources of irrigations for temporary crops, large percent (46.14%) of the households have reported that their source of irrigation was natural flow canal which is followed by tube well/boring (34.65%).

**Table 2.2: Distribution of HH by sources of irrigation in the district**

Sources of irrigation	Temp. crops		Temp fallow		Permanent graze land		App. forest	
	No.	%	No.	%	No.	%	No.	%
Tube well, boring	1273	34.65	1267	6.60	-	-	-	-
Continuous flow canal	-	-	2820	14.69	141	33.33	-	-
Natural flow canal	1695	46.14	7059	36.78	141	33.33	-	-
Pond/ well	283	7.70	1412	7.36	141	33.33	-	-
Mixed	282	7.68	2401	12.51	-	-	-	-
Others	141	3.84	2542	13.24	-	-	-	-
<b>Total</b>	<b>3674</b>	<b>100.00</b>	<b>19194</b>	<b>100.00</b>	<b>423</b>	<b>100.00</b>		

Source: Annex Table 35, 36, 37, and 38

### Leased land

Small segment of population (1.90 %) have given land to others on lease and the average holding of leased out land is 0.0069 ha/household.

**Table 2.3: Frequency and percentage of households reporting leased out land and holding seize**

Leased out land			HH	
	Area (ha)	Mean (ha/HH)	No.	%
Khet	309.12	.0052	1128	1.90
Bari	509.98	.0086		
<b>Total</b>	<b>819.10</b>	<b>.0069</b>		

Source: Annex Table 41 and 42

A total of 1551 households (2.62 %) have owned land on lease from others.

**Table 2.4: Frequency and percentage of households reporting leased in land**

Leased in land	HH	
	No.	%
Yes	1551	2.62
No	57711	97.38
<b>Total</b>	<b>59262</b>	<b>100.00</b>

Source: Annex Table 43

A total of 62.02 percent households are found to have leased land on cash contract basis followed by 34.04 percent on crop share basis.

**Table 2.5: HH reporting leasing land by type of land tenure system (ha)**

Type of land tenure	Khet	Bari	Orchard	Pond	Total (ha)	%
Contract ( cash)	178.83	157.87	-	-	336.7	62.02
Contract (kind)	-	-	-	-	-	
Crop sharing	184.77	-	-	-	184.8	34.04
Exchange for service	21.39	-	-	-	21.4	3.94
Mortgage	-	-	-	-	-	
Others	-	-	-	-	-	
<b>Total</b>	<b>384.99</b>	<b>157.87</b>			<b>542.9</b>	<b>100</b>

Source: Annex Table 44

### 3.4 Cropping patterns and cropped area

Rice-wheat-maize and Rice-rice-wheat were major cropping pattern of Khet land covering 31.10 and 24.82 percent of the Khet land respectively with mean land holdings of 0.10 ha/HH for both pattern.

**Table 2.6: Cropping patterns in Khet land and mean land holdings area**

Cropping pattern	Area (ha)	%	Mean ( ha/HH)
Rice-Rice-Wheat	2250.71	24.82	0.10
Rice-Wheat-Fallow	427.56	4.71	0.02
Rice-Wheat-Maize	2820.47	31.10	0.10
Rice-Wheat-Vegetable	-	-	-
Rice-Pulses-Fallow	-	-	-
Rice-Wheat-Moong	-	-	-
Rice-Wheat-Dhaincha	-	-	-
Rice-Potato-Fallow	186.83	2.06	0.02

Rice-Maize-Fallow	1002.43	11.05	0.04
Rice-Fallow-Fallow	1852.11	20.42	0.04
Rice-Barley-Fallow	-	-	-
Rice-Millet-Fallow	-	-	-
Other	528.16	5.82	0.02
<b>Total (n=59261)</b>	<b>9068.29</b>	<b>100.00</b>	<b>0.153</b>

Source: Annex Table 45

Vegetable-maize and Maize/uplandrice-fallow were major cropping pattern in Bari land covering 17.03 and 14.74 percent Bari land.

**Table 2.76: Cropping patterns in Bari land and mean Bari land area**

Cropping pattern	Area (ha)	(%)	Mean ( ha/HH)
Maize/Upland rice-Fallow	2545.58	14.74	0.15
Maize/Millet-Fallow	2059.06	11.92	0.04
Maize/Millet-Wheat	1221.06	7.07	0.04
Upland rice-Fallow-fallow	53.89	0.31	0.02
Maize-Tori-Fallow	1961.66	11.36	0.05
Maize- Rice- Wheat	334.14	1.94	0.04
Maize-Barley	948.54	5.49	0.11
Jute-Tori-Fallow	-	-	-
Jute-Wheat- Fallow	-	-	-
Vegetable-Vegetable	182.34	1.06	0.02
Vegetable-Maize	2939.72	17.03	0.06
Off season vegetable	273.06	1.58	0.01
Others	4747.90	27.50	0.08
<b>Total (n=59261)</b>	<b>17266.96</b>	<b>100.00</b>	<b>0.29</b>

Source: Annex Table 46

### 3.5 Use of improved seeds

A total of 20.24 per cent of the households reported using improved seeds. Out of 11426 households using improved seeds, improved rice, wheat, maize, and vegetable seeds were used by 49.39, 3.71, 60.49, and 44.42 per cent of households.

**Table 2.8: HH using improved seeds (%)**

Total		Rice	Wheat	Maize	Oilseeds	Pulses	Vegetables	Potato	Other
No.	%	%	%	%	%	%	%		%
11994	20.24	49.39	3.71	60.49	0.00	-	44.42	1.24	1.24
<b>n=59267</b>		<b>(n=11426)</b>							

Source: Annex Table 47 and 48,

### 3.6 Marketing of farm product

Following table presents the distribution of HH selling their farm product in different places. Farm gate were found to be the major places from where 8.99 percent of the households sell their products besides 'other' from where 83.14 percent of households sell their products.

**Table 2.9: Frequency and percentage of HH selling produce at different places**

Place of sale	HH	
	No.	%
Farm gate	4515	8.99
Rural haat bazar	141	0.28
District market	564	1.12
Vendor		0.00
Cooperatives	989	1.97
Sales depot	2260	4.50
Others	41760	83.14
<b>Total</b>	<b>50228</b>	<b>100.00</b>

Source: Annex table 49

### 3.7 Use of chemical fertilizers and pesticides

A total of 28.34 percent of households reported that they are using chemical fertilizers and pesticides.

**Table 2.10: Frequency and percentage of HH using chemical fertilizer and pesticides**

Response	HH	
	No	%
Yes	16796	28.34
No	42468	71.66
<b>Total</b>	<b>59264</b>	<b>100.00</b>

As has been reported by MoAD, the total amount of fertilizer sold in the district is divided by the cultivated area to derive average amount of Nitrogen, Phosphate and Potash used in farm in different varieties of crops, which is given in the following table. However, the amounts of different fertilizer nutrients used are except nitrogen are lower than the recommended dose in all kinds of crops whether it is irrigated or rain-fed.

**Table 2.11: Amount of fertilizer nutrients used by HH in different crops (kg/ha)**

Nitrogen	Phosphate	Potash
35	30	2.5

Source: DADO (2015)

From the following table, it is clear that out of 16796 households using fertilizers and pesticides 95.80 percent reported that fertilizers and pesticides were available as and when needed.

**Table 2.12: Frequency and percentage of households reporting availability of fertilizer and pesticides**

Response	HH	
	No.	%
Yes	16091	95.80
No	705	4.20
<b>Total</b>	<b>16796</b>	<b>100.00</b>

Source: Annex Table 51

### 3.8 Sources of fertilizers/pesticides

There are various sources of buying fertilizers/pesticides for the use of agricultural purposes. Among them agro vets are the main sources, from where 58.07 percent of the households buy them, followed by cooperatives from where 41.93 percent of the households buy.

**Table 2.13: HH buying fertilizers/pesticides from different sources**

Source	HH	
	No.	%
Cooperatives	6213	41.93
Agro vets	8606	58.07
DADOs/ASCS	-	-
Neighbor farmers	-	-
Relatives	-	-
Others	-	-
<b>Total</b>	<b>14818</b>	<b>100.00</b>

Source: Annex Table 52

A total of 53.71 percent of the households reported purchasing place as a source of information on safe use of fertilizer and pesticides followed by own experience reported by 31.48 percent of the households

**Table 2.14: Households reporting source of information for safe use of fertilizer and pesticides**

Source	HH	
	No.	%
From Purchasing place	4095	53.71
Extension Service	-	-
Neighboring Farmers	141	1.85
Friends	423	5.54
Relatives	283	3.71
Own experiences	2400	31.48
Others	424	5.56
<b>Total</b>	<b>7624</b>	<b>100.00</b>

Source: Annex Table 53

### 3.9 Reason for low use of fertilizers/pesticides:

An enquiry into the reason for inadequate use of fertilizer nutrients/pesticides by the farmers, 'other' was reported by 80.71 percent of the households. However, 11.45 percent of households have reported that the reason for not using them is due to its unavailability.

**Table 2.15: HH reporting reasons for low use of fertilizers/pesticides**

Reason	HH	
	No.	%
Not available	4942	11.45
No money	3389	7.85
Other	34846	80.71
<b>Total</b>	<b>43177</b>	<b>100.00</b>

Source: Annex Table 54

There is low existence of advice on safe use of fertilizer and pesticides as only 13.34 percent of the households reported its existence.

**Table 2.16: HH reporting on advisory on safe use of fertilizer and pesticides**

Response	HH
----------	----



	No.	%
Yes	7908	13.34
No	51357	86.66
<b>Total</b>	<b>59261</b>	<b>100.00</b>

Source: Annex Table 55

### 3.10 Livestock production

Livestock is closely associated with agricultural occupation of the population, hence is an integral part of agriculture for their livelihood. Those who have adopted agriculture as their main occupation, used to hold the livestock as well, as such 92.87 percent of the households have raised livestock.

**Table 2.10: Frequency and percentages of households raising livestock**

Response	HH	
	No.	%
Yes	55037	92.87
No	4227	7.13
Total	59264	100.00

Source: Annex Table 56

Majority of the HH have raised local breeds of cattle, buffaloes, goats, and pigs. Improved breeds of cow, buffalo, and goat were raised by only 0.77, 1.03, and 0.77 percent of the households.

**Table 2.117: Types of breeds of livestock owned**

Animal species	Type of breeds	HH (%)	Animal (no.)	Mean (Animal/HH)
Cattle	Local	30.26	37249	2.24
	Improved	0.77	3955	9.33
Buffalo	Local	71.29	72275	1.84
	Improved	1.03	989	1.75
Yak	Local	0.00	0	0.00
Goat	Local	76.16	189953	4.53
	Improved	0.77	1978	4.67
Sheep	Local	2.05	3945	3.50
Pig	Local	16.92	16929	1.82
			1554	3.67
Rabbit	Local	0.77	283	1.00
Horse/mule	Local	0.51	141	1.00
Others	Local	0.26	989	1.75
<b>Total</b>		<b>n=55037</b>		

Source: Annex Table 57 (Note: Total of the percentage will not match with 100 as it is multiple answers)

### 3.12 Livestock housing and feeding

Regarding the livestock housing 98.98 percent of the households have reared their livestock in the shed separately.

**Table 2.12: Place of housing of livestock**

Place of housing livestock	HH	
	No.	%
In the shed separately	54473	98.98
In the residential house	140	0.25

Both	423	0.77
<b>Total</b>	<b>55036</b>	<b>100.00</b>

Source: Annex Table 58

### 3.13 Milk and milk products

Among those HH who have raised livestock, 40.41 percent have reported that they sell milk and milk products. The amount of milk sold per annum was found to be 2947.05 litres per household

**Table 2.13: Milk and milk products production and sale**

Response	HH		Average milk sold
	No.	%	Liters/HH/Year
Yes	2963	5.384	647.58
No	52074	94.616	
<b>Total</b>	<b>55037</b>	<b>100.000</b>	

Source: Annex Table 59 and 60

Largest percentage (40.86%) of the households sold their milk at home followed by 31.83 percent who sold milk at collection center.

**Table 2.21: HH selling milk at different places**

Different Place to sell Milk	HH	
	No.	%
Home	1268	40.86
Collection center	988	31.83
Village	706	22.76
Neighbor	-	-
District headquarter	424	13.66
Hotel	-	-
Others	-	-
<b>Total</b>	<b>3103</b>	<b>100.00</b>

Source: Annex Table 61

### 3.14 Feeds and feeding

Regarding the type of feeding for the livestock, feeding, stall feeding was reported by 77.17 percent households.

**Table 2.22: HH with different type of feeding**

Type of feeding	HH	
	No.	%
Stall feeding	42475	77.17
Feeding in pasture land	706	1.28
Both	11858	21.54
<b>Total</b>	<b>55039</b>	<b>100.00</b>

Source: Annex Table 62

Regarding the type of feeds given to the livestock, mixed feed were fed by 92.33 per cent of the households followed by 3.96 percent who reported feeding green grasses. Concentrate was fed by 1.32 percent of the households.

**Table 2.23: Livestock feeds and feeding types**

Types of Feeds	HH	
	No.	(%)
Fodder/straw	989	1.85
Green Grasses	2114	3.96
Forage	423	0.79
Concentrates	705	1.32
Mixed	49250	92.33
Other	283	0.53
<b>Total</b>	<b>53340</b>	<b>100.00</b>

Source: Annex Table 63

### 3.15 Poultry

Poultry was raised by 55.48 percent of the households in the district.

**Table 2.24: Households raising poultry**

Rearing of poultry	HH	
	No.	%
Yes	32880	55.48
No	26386	44.52
<b>Total</b>	<b>59266</b>	<b>100.00</b>

Source: Annex Table 64

Local poultry hen was raised by 85.85 percent of HH. About 8.99 percent of the households raised improved broiler of poultry. The average number of local chicks and local cocks is found to be 7.10 and 3.62 respectively.

**Table 2.25: Average number of improved and local poultry breed reared**

Type of birds	No. of HHs	HH (%)	No. of birds	Mean
<b>Poultry</b>				
Local Chick	14536	44.21	103177	7.10
Local Cock	24558	74.69	88908	3.62
Local Hen	28229	85.85	124345	4.40
Local dry	848	2.58	4803	5.67
Improved Broiler	2957	8.99	988700	334.40
Improved layer	281	0.86	1407	5.00
<b>Duck</b>				
Local Chick		0.00		
Local Cock	141	0.43	141	1.00
Local Hen	141	0.43	283	2.00
Local dry	-	-	-	-
<b>Pigeon</b>				
Local Chick	-	-	-	-
Local Cock	-	-	-	-
Local Hen	141	0.43	565	4.00
<b>Other</b>	-	-	-	-
<b>Total</b>	<b>n=32880</b>			

Source: Annex Table 66(Note: Total of the percentage will not match with 100 as it is multiple answers)

### 3.16 Fishery

Small percentage of the household (0.95%) reported rearing of fish. Average size of pond was 0.5 ha. (Annex 65 and 67)

### 3.17 Forest

As regards to the HH involving in forest land, 23.38 percent of the households reported involvement in community forest , the average holding is found to be 10.711 ha/HH. Similarly 0.72 percent households reported owning compact forest.

**Table 2.26: Frequency and percentage of HH having different forest area**

Different forest area	No. of HHs	HH (%)	Sum (ropani)	Mean(ha)
Compact Forest	424	0.72	1271	0.15
Scatter Forest	7198	12.15	738298.80	5.13
NTFP Area	1129	1.91	28883.50	1.28
Community Forestry	13822	23.32	2961608.21	10.71
Other Forest Area	1693	2.86	8473.93	0.25
<b>Total (n=59261)</b>				

Source: Annex Table 68

## CHAPTER IV: CLIMATE CHANGE, AGRO-ADVISORY & AGRO-MET ADVISORY

One of the major components of BRCH project is to provide timely and proper use of weather forecasts, agro-advisory and agro-met advisory operations in order to increase production and productivity of commodities through proper use of introduced agricultural management information system. By the impact of climate change, environment relating to eco-systems become more vulnerable to natural hazards, which need to be adjusted in existing practices, processes or structures in order to counter potential future disasters. Through the warnings and advisory services, it is expected that BRCH project might benefit the people residing in the study districts and climate-vulnerable communities in particular.

### 4.1 Climatic hazards, their occurrence and support

The survey result about the experience on climate change by the community revealed that the households experiencing climate change during last one year was reported to be 76.42 percent out of 59268 households. In case of climatic hazards, 73.82 percent of the households who have experienced climate change reported drought which is followed by extreme high temperature (57.95%), hailstorm (30.85%) and extreme frost (4.99%), .

**Table 3.1: Experience on different kinds of climatic hazards (extreme events) during last one year**

Experiencing climate change	HH	
	No.	%
Climate change	45293	76.42
<b>Experiencing Climatic Hazards</b>		
Hail Storm	13971	30.85
Extreme high temperature	26244	57.95
Extreme cold	2260	4.99
Extreme Frost	3246	7.17
Floods	2825	6.24
Drought	33433	73.82
Others	1411	3.12
<b>Total</b>	<b>45290</b>	<b>100.00</b>

Source: Annex Table 69 and 70

(Note: Total of the percentage will not match with 100 as it is multiple answers)

At the time of occurrence of hazards, it is natural and obvious to seek support from the government as well as from the NGOs/INGO. In this regard, 57.10 percent households reported that they had support from family followed by 42.80 percent who reported having supported themselves from their own saving.

**Table 3.2: Households reporting support from different agencies during climatic hazards**

Agencies	HH	
	No.	%
Government support	141	14.30
Family support	564	57.10
INGO		0.00
Saving	423	42.80
Asset		0.00
Friend/relative	283	28.60
Others	141	14.30
<b>Total</b>	<b>988</b>	<b>100.00</b>

Source: Annex Table 71 (Note: Total of the percentage will not match with 100 as it is multiple answers)

At the time of occurrence of hazards, it is the responsibility of the people to protect their life and their goods, agricultural crops, livestock etc. provided that if the people have knowledge and experience about the reduction of hazard due to climate change. In this regards, 86.99 and 13.01 percent of households reported taking measures to protect lives and others.

**Table 3.3: Households taking measures to mitigate climatic hazards**

Measures	HH	
	No.	%
Protect lives	2825	86.99
Protect household goods	283	8.70
Protect agriculture	283	8.70
Protect livestock	283	8.70
Protect others	423	13.01
<b>Total</b>	<b>3248</b>	<b>100.00</b>

Source: Annex Table 72 (Note: Total of the percentage will not match with 100 as it is multiple answers)

#### 4.2 Experience on different types climatic extremes in different seasons

During last 15 years, 71.18 percent of the households reported experiencing change in climate.

**Table 3.4: Households experiencing climate change in last 10 - 15 years**

Response	HH	
	No.	%
Yes	42183	71.18
No	17080	28.82
<b>Total</b>	<b>59263</b>	<b>100.00</b>

Source: Annex Table 73

Among the households who had experienced change in climate, 77.60, 42.79, and 4.20 percent of the households reported low rainfall during dry, rainy, and winter season while 18.04, 17.72, and 5.02 percent reported high rainfall. Frequent droughts and floods were reported by 24.74 and 5.34 percent household in rainy season. Increased temperature was reported by 59.18, 60.94, and 30.51 percent households during dry, rainy and winter season. Frequent hail storm was reported by 23.09, 13.06, and 2.01 percent of the households during dry, rainy, and winter season. During winter season, 3.35 percent households reported experiencing extreme cold and 10.03 percent frequent drought.

**Table 3.5: HH experiencing different types of climatic extremes**

Types of Climatic Extreme	Dry Season (Jan-April)		Rainy Season (May-August)		Winter Season (September-December)	
	No.	%	No.	%	No.	%
Less overall rainfall	32736	77.60	18051	42.79	1694	4.02
More overall rainfall	7609	18.04	7473	17.72	2118	5.02
More frequent drought	28931	68.58	10434	24.74	4232	10.03
More frequent flood	1693	4.01	2251	5.34	563	1.33
Strong wind	1270	3.01	7763	18.40	140	0.33
More cold spells or foggy days	283	0.67	424	1.00	1413	3.35
Higher temperature	9740	23.09	5509	13.06	848	2.01
Frequent hailstorm	-	-	283	0.67	141	0.33
Lower ground water table	1695	4.02	848	2.01	283	0.67
Other	-	-	-	-	-	-

<b>Total</b>	<b>n=42381</b>
--------------	----------------

Source: Annex Table 74(Note: Total of the percentage will not match with 100 as it is multiple answers)

### 4.3 Early warning messages

The survey result shows that the awareness on early warning message about climate/weather hazards were reported by only 23.33 percent of the households in the district.

**Table 3.6: Households reporting receipt of early warning messages**

Response	HH	
	No.	%
Yes	13830	23.33
No	45439	76.67
<b>Total</b>	<b>59269</b>	<b>100.00</b>

Source: Annex Table 75

Among various sources of early warning messages, 94.85 percent of households have reported that the early warning was received from radio/TV followed by 27.85percent who had message from telephone.

**Table 3.7 Households reporting receipt of early warning from different sources**

Sources	HH	
	No.	%
Telephone	3812	27.85
Radio/TV	12981	94.85
Siren	565	4.13
Colorful flag	141	1.03
Hand mike	-	-
Bulletin/newspaper	141	1.03
Others	-	-
<b>Total</b>	<b>13685</b>	<b>100.00</b>

Source: Annex Table 76(Note: Total of the percentage will not match with 100 as it is multiple answers)

#### 4.3.1 Perception about the need of types of communication media for early warning

When asked about the early warning system from various communication media, 89.33 percent of households preferred telephone followed by SMS on mobile (84.48%) and radio/TV (70.14%).

**Table 3.8: Households selecting suitable EWS and agricultural information medium**

Medium for delivery of Early information	HH	
	No.	%
Telephone	51931	89.33
SMS on mobile	49110	84.48
Siren	37960	65.30
FM Radio/TV	40774	70.14
Newspaper	10301	17.72
Digital display board	30763	52.92
Internet	8185	14.08
Others	1129	1.94
<b>Total</b>	<b>58131</b>	<b>100.00</b>

Source: Annex Table 77(Note: Total of the percentage will not match with 100 as it is multiple answers)

When asked about the location for fixing the digital display board, DADO/DLSO was given the highest priority for placing the digital display board by 58.29 percent of the households. Second priority was given to agro vet.

Table 3.9: Priority of location suitable for Digital Display Board

Location	HH	
	No.	%
DADO/DLSO offices	32886	58.29
Agriculture/Livestock Sub Center	2824	5.01
VDC/DDC offices	282	0.50
Markets	141	0.25
Agro Vet	20170	35.75
Other place	114	0.20
<b>Total</b>	<b>56417</b>	<b>100.00</b>

Source: Annex Table 78

#### 4.3.2 Accessibility to agricultural advice and sources

The survey result shows that only 13.09 percent of the households are found to have received agro advisory service during the last 12 months. A total of 216 households reported DADO as a source for agro advisories. (Annex Table 79 and 80).

#### 4.3.3 Need for agro advisory

Almost all of the households (96.87%) have preferred mobile service, 84.64 percent telephone, and 61.07 percent toll free for delivery of agro advisory.

Table 3.10: HH preferring advisory services by type

Types of advisory	HH	
	No.	%
Mobile service	56861	96.87
Telephone	49677	84.64
Newspaper/Bulletin	15945	27.17
Toll free	35843	61.07
Internet service	9314	15.87
Digital display board	30618	52.16
Others	423	0.72
<b>Total</b>	<b>58696</b>	<b>100.00</b>

Source: Annex Table 81 (Note: Total of the percentage will not match with 100 as it is multiple answers)

#### 4.3.4 Communication and media for agricultural program

For the development of any region or place communication plays an important role. There are number of communication media such as FM radio, television, newspaper etc., through which agriculture programmes are being broadcasted in order to make farmers aware of adopting farming system and disseminating information on pre-warning of climate and weather. However, from the survey it is observed that the percentage of HH listening agriculture programme on radio is found to be 29.52 percent of the households regularly listened while 1.91 percent of the households reported watching agricultural program in television,. A total of 6.67 percent of the households reported reading agricultural subjects in newspapers and magazines. This shows that communication media are still not able to cover most of the population. (Annex Tables 82, 83, and 84).



## Annex 1

## Monthly Average Temperature and Rainfall in Tansen, Palpa

	Month	Maximum	Minimum	Rainfall MM	Rainy days
1	July	18.2	7.7	24.7	1.7
2	August	19.9	9.2	35.4	3.4
3	September	24.1	13.2	26.7	2.6
4	October	28.2	16.9	31.4	4.4
5	November	28.3	19.1	71.4	6.9
6	December	28.1	20.2	271.1	14.9
7	January	27.1	20.6	480.2	19
8	February	27.9	20.4	407.6	17.9
9	March	28.2	19.5	208.9	10.4
10	April	27.1	16.2	28.1	1.4
11	May	23.9	12.4	16.3	1
12	June	20.2	9	10.9	1.1