

Nepal Food Security Cluster

**Nepal Earthquake:  
Agricultural Livelihood Impact Appraisal  
in Six Most Affected Districts**



Dhading, Dolokha, Gorkha, Nuwakot, Rasuwa and Sindhupalchock

Kathmandu 06.06.15



Food and Agriculture Organization  
of the United Nations



NEPAL  
**FOOD SECURITY CLUSTER**  
*Strengthening Humanitarian Response*



# Table of Contents

<b>EXECUTIVE SUMMARY .....</b>	<b>4</b>
<b>1. INTRODUCTION.....</b>	<b>5</b>
OBJECTIVES.....	5
METHODOLOGY .....	5
LAYOUT OF THE REPORT.....	6
<b>2. OVERVIEW OF AGRICULTURE IN THE SIX DISTRICTS .....</b>	<b>7</b>
2.1 AGRICULTURAL SYSTEM IN NEPAL.....	7
2.2 IMPORTANCE OF AGRICULTURE IN THE SIX DISTRICTS .....	7
<b>3. EARTHQUAKE IMPACT: CROPS .....</b>	<b>10</b>
3.1 INTRODUCTION .....	10
3.2 STORED CROP LOSSES.....	10
3.3 STANDING CROP LOSSES .....	12
3.4 SEED LOSSES .....	13
3.5 KITCHEN GARDENS .....	15
<b>4. EARTHQUAKE IMPACT: AGRICULTURAL TOOLS, FERTILIZERS AND LABOUR.....</b>	<b>16</b>
4.1 TOOLS AND EQUIPMENT .....	16
4.2 FERTILIZERS .....	16
4.3 LABOUR .....	17
<b>5. EARTHQUAKE IMPACT: LIVESTOCK.....</b>	<b>18</b>
5.1 INTRODUCTION .....	18
5.2 LIVESTOCK DEATHS.....	18
5.3 LIVESTOCK INJURIES AND ILLNESS .....	19
5.4 SHELTER, FEED AND WATER.....	20
5.5 NUTRITIONAL IMPACTS .....	21
<b>6. EARTHQUAKE IMPACT: IRRIGATION AND AGRICULTURAL INFRASTRUCTURE .....</b>	<b>22</b>
<b>7. AGRICULTURAL LIVELIHOOD SUPPORT NEEDS AND IMPLICATIONS FOR RESPONSE.....</b>	<b>23</b>
7.1 SOME ISSUES TO BE TAKEN INTO ACCOUNT IN THE RESPONSE .....	23
7.2 CROP NEEDS.....	24
7.3 LIVESTOCK NEEDS.....	25
7.4 RESILIENT LIVELIHOOD RECOVERY .....	26
<b>ANNEXES.....</b>	<b>29</b>
ANNEX 1. 2015 NEPAL EARTHQUAKE INTENSITY AND EXTENT MAP (SOURCE: FAO GIEWS) .....	30
ANNEX 2: MAP OF VDCs VISITED FOR QUALITATIVE FIELDWORK .....	31
ANNEX 3. SAMPLED AREAS IN HOUSEHOLD SURVEY CONDUCTED BY WFP (SOURCE: WFP) .....	32
ANNEX 4. NET AND PER CAPITA PRODUCTION AND NATIONAL RANK FOR MAIN NON CEREAL COMMODITIES, 2014 .....	32
ANNEX 5. AGRICULTURAL PROFILES OF THE SIX DISTRICTS (SOURCES: MoAD, CBS, DISTRICT AND VDC PROFILE OF NEPAL 2014-2015, UNDP) .....	35
ANNEX. 6 LIST OF FAO ENUMERATORS IN THE SIX DISTRICTS.....	53

## Executive Summary

The earthquake that struck Nepal on April 25<sup>th</sup> resulted in huge devastation across 14 districts in the country. Six districts – Dhading, Dolokha, Gorkha, Nuwakot, Rasuwa and Sindhupalchock - were particularly badly hit and were further affected by several aftershocks including a particularly big one measuring 6.8 on the Richter scale on May 12<sup>th</sup>. In order to understand the impact of the earthquake and associated aftershocks on agriculture in the most severely affected districts, an Agricultural Livelihood Impact Appraisal (ALIA) was undertaken. The ALIA was a Nepal Food Security Cluster exercise led by FAO.

The study confirms that agricultural livelihoods in the six districts suffered particularly high levels of damage, and therefore support to livelihoods in these districts should be prioritised in agricultural recovery programmes. The key findings of the ALIA are as follows:

**Crops:** Impact on stored crops is very significant, particularly for rice maize and millet. Impact on standing crop much lower, but further damage can be expected on growing crops and post-harvest. Impact on seed availability is very significant for rice and millet, posing a further threat to household food security from October onwards, when the crops will be harvested.

**Agricultural Tools, Fertilizer and Labour:** The proportion of agricultural tools destroyed is particularly high in the six districts, and this will seriously reduce capacity for cultivation. Household access to fertilizer reduced, further threatening production prospects in the summer cropping season. A steep reduction in labour availability for agriculture is apparent as households struggle to meet more urgent shelter needs for themselves and their livestock.

**Livestock:** Livestock ownership is a major contribution to agricultural livelihoods, 80% of households own animals. Animal losses due to the earthquake are significant with 16% for cattle and 36% for poultry with more animals injured and sick. Animal health is at risk due to lack of shelter and feed and limited access to veterinary services. Production of animal products has been reduced due to stress syndromes and deteriorated health conditions. This affects household consumption and income earning.

**Irrigation and Agricultural Infrastructure:** If not repaired quickly, damage to small-scale irrigation will have significant negative consequences on crop production in the winter cropping season. Damage to Agricultural and Livestock Service Centre buildings and facilities will seriously affect the ability of extension staff to provide technical services to farmers.

**Crop Needs:** The most urgent needs for the summer cropping season are clearly seeds and fertilizers, followed by irrigation, tools and technical support. The window for rice planting has almost closed, however there is still time to provide millet and vegetable seeds. Rehabilitation of irrigation will be a critical need for the winter cropping season, as well as barley and wheat seeds.

**Livestock needs:** The most urgent need is shelter, followed by feed, medicine and vaccinations, and water. Recovery of shelter, support to feed and water access will need to continue beyond the next three months. Restocking of livestock will become necessary and appropriate once the health conditions of surviving animals can be guaranteed and households can access sufficient feeding.

**Resilient Livelihood Recovery:** In meeting the agricultural needs of communities, interventions should be phased and designed appropriately to support and promote resilient livelihood recovery. This implies to not only focus on the effects of this earthquake but rather have a comprehensive approach to reduce the vulnerability of households to other more frequent hazards, such as landslides, floods, droughts, pests and diseases. Particular awareness should be given to the needs of women farmers and elderly headed households.

# 1. INTRODUCTION

A major earthquake of shallow depth measuring 7.6 on the Richter scale struck central Nepal on April 25<sup>th</sup> causing widespread destruction. There have been several aftershocks, including a big one measuring 6.8 on May 12 causing further casualties and damage. As of May 21, the Government has reported more than 8,631 deaths and over 21,838 people injured. Given the level of shaking intensity and severe impact in remote districts, these numbers may continue to rise. According to initial estimates, this earthquake has caused significant damage to buildings and infrastructure and has triggered landslides and avalanches causing further damage and disruption in essential services delivery. In the affected districts, approximately 289,000 houses have been destroyed and 255,000 houses have been damaged causing homelessness on a large scale.

Above all, this disaster has been a rural disaster. Whilst urban areas have been hit, it is the rural areas closest to the epicentre of the earthquake and with more fragile constructions which have been most affected. Nepal continues to be a deeply rural society, with 76% of all households in rural areas, 95% of which own some land. The contribution of agriculture to GDP has remained almost unchanged since 2001 at around 35%. Although it generates only one third of the country's output, it employs close to two thirds of the population, thereby reflecting the sector's low productivity.

In order to understand the impact of the earthquake and associated aftershocks on agriculture in the most severely affected districts, an Agricultural Livelihood Impact Appraisal (ALIA) was undertaken in May 2015. The Appraisal consists of information from three main sources:

- (a) Secondary data collected from the District Agricultural and Livestock Development Offices and the Ministry of Agricultural Development (MoAD);
- (b) A qualitative field assessment, using Key Informants at district and VDC level, led by the Food and Agriculture Organization on behalf of the Nepal Food Security Cluster, and;
- (c) A Food Security Cluster household level survey led by WFP and NeKSAP.

The ALIA focuses on the six districts thought to be most seriously affected by the earthquake in terms of losses to lives and livelihoods. The six districts covered are Dhading, Dolakha, Gorkha, Nuwakot, Rasuwa and Sindhupalchok.

## Objectives

The objectives of the ALIA are as follows:

1. To obtain a coherent picture of the impact of the earthquake on agriculture in the six most affected districts.
2. To identify priorities for recovery for families dependent upon agriculture for their livelihoods in these six districts.
3. To provide an input into the Agricultural sector section of the Post Disaster Needs Assessment (PDNA) led by the Government of Nepal in partnership with the UN, EU and World Bank.

## Methodology

The Appraisal uses secondary data which has been collected at district level by MoAD field staff and FAO assessment teams. This was then compiled at Kathmandu level to form an initial overview of the impact of the disaster on crops, livestock and irrigation. This information was further enriched by a FAO led qualitative assessment which was carried out by six teams, each consisting of a crops, livestock and nutrition expert. Each team covered one district, operating at two levels. First,

consultations were held with District level officials to obtain an overview of the losses in agriculture at the district and service centre levels<sup>1</sup>. This was followed by Key Informant interviews in three Village Development Committees (VDCs) per district to obtain more in-depth information on damage, impact on livelihoods and priorities for short and longer term support to assist recovery. The VDCs were selected from a larger set of “highly affected agricultural VDCs” which was derived through discussion with the DADO and other district level government staff. These VDCs were those in which impact of the earthquake was severe AND where agricultural and livestock production is the most important part of livelihood. In order to provide a stronger quantitative element to the ALIA, household level information from the Food Security Cluster household survey was incorporated. This was done through a re-analysis of a sub-sample of the overall dataset, focussing on the 540 households surveyed in the six districts out of the total 1001 households sample for the 11 districts. Out of the 540 households, 206 (38%) were “demographically vulnerable” – made up of a group including households headed by women, the elderly, children, or by a single male, with chronically ill or disabled household member(s). Of these 70 (13%) were headed by women. The analysis has been conducted by FAO with active contributions of the MoAD and inputs from Food Security cluster partners.

### **Layout of the report**

The remainder of this report is organised into six sections as follows:

- Section 2 - Overview of agriculture in the six districts;
- Section 3 – Earthquake impact: Crops;
- Section 4 - Earthquake Impact: Fertilizers, tools and labour;
- Section 5 - Earthquake Impact: Livestock;
- Section 6 - Earthquake Impact: Irrigation and Agricultural infrastructure;
- Section 7 – Agricultural livelihood support needs and implications for response.

The Annex section contains in particular district agricultural profiles for each of the six districts.

---

<sup>1</sup> Within each district there are Agricultural Service Centres (ASCs) and Livestock Service Centres (LSCs). Each service centre provides extension services to farmers in a cluster of Village Development Committees (VDCs). The number of ASCs is fixed at between 4 and 6 per district, whereas there can be as many as 15 LSCs in a district.

## 2. OVERVIEW OF AGRICULTURE IN THE SIX DISTRICTS

### Key messages

- The six districts are situated in hilly and mountain areas. They are not major cereal producers but still contribute significantly to the national production for maize and particularly for millet.
- Per capita production of potato, milk and meat is above the national average, indicating the importance of these commodities in household livelihood portfolios
- Agricultural losses caused by the earthquake will have an impact on national production for certain commodities as on livelihoods at household level.

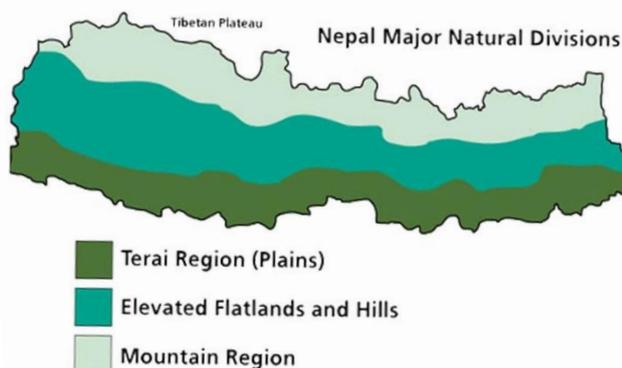
### 2.1 Agricultural system in Nepal<sup>2</sup>

Nepal is divided into three physiographic regions—mountains, hills and Terai—with elevation ranging from 60 m in the Terai flatland in the south to 8848 m Himalayas in the north. Climate also varies according to topography from alpine and tundra in the north to subtropical in the south. Precipitation ranges from 1500 mm to 2500 mm and 60-80 percent is received from June to September. More than 70 percent of this monsoon rain goes to waste and, at times, causes heavy loss of lives and assets. Owing to different topography and climate, Nepal is home for many varieties of flora and fauna.

Nepalese farming systems are characteristically complex, consisting of diverse combinations of crops, livestock, poultry, vegetables, fruits, spices, fisheries, agro-forestry and non-timber forest products. The average farm size is 0.8 ha with 47 percent landholdings of size less than 0.5 ha. Rice, maize, wheat, finger millet and barley are the major cereals grown. Maize and millet are mostly grown in the non-irrigated uplands and rice-based cropping pattern is popular in the irrigated areas.

Oilseeds, pulses, sugarcane and potato are the other important crops. Different fruits and vegetables are cultivated in summer and winter seasons in different physiographic regions. Aquaculture is popular in the southern Terai flat land and river systems originating mostly from the Himalayas harbor indigenous fish species.

Important livestock include cattle, buffalo, goat, sheep and pig. Poultry keeping is increasingly popular as demand from urban areas is rising. About two-thirds of the milk and half of the meat produced in the country is contributed by buffalo alone.



### 2.2 Importance of agriculture in the six districts

The six districts are situated in the Central Northern part of the country with a great diversity in altitude and population. Overall, Rasuwa and Dolakha are mostly mountainous, Dhading and Gorkha<sup>3</sup>

<sup>2</sup> Source: Agricultural Extension Services Delivery in Nepal (FAO 2010)

<sup>3</sup> Gorkha district also includes mountain areas but most of the population lives in the hilly areas.

are hilly, while Sindhupalchock is partly mountainous and hilly. As we can see in the table below, the great majority of the population draws its livelihood from agriculture, which represents also the main source of income.

**Table 1. Total and farming population<sup>4</sup>**

District	Total population	Number of households	HHs whose main source of income is agriculture
Dhading	336,250	64,517	75%
Sindhupalchock	289,455	58,998	77%
Nuwakot	278,761	53,984	85%
Gorkha	269,388	57,671	78%
Dolakha	188,186	40,718	75%
Rasuwa	43,798	8,504	78%

These districts are not major cereal producers compared to the Terai area, where 22 districts make up the bulk of the national cereal production. However the six districts still contribute significantly to the national maize production (9.5%) and even more for millet (18.1%), as per the table below showing the average for the last five years (2010-2014).

**Table 2. Five-years average of cereal production and contribution to national production<sup>5</sup>**

		RASUWA	DOLAKHA	DHADING	NUWAKOT	SINDHUP.	GORKHA	Total
Paddy	prod (Mt)	3113	6660	36603	58004	27805	42354	174540
	% nat. prod.	0.1	0.2	0.9	1.4	0.7	1.0	4.2%
Maize	prod (Mt)	4370	13602	33184	50851	52199	43156	197362
	% nat. prod.	0.2	0.7	1.6	2.4	2.5	2.1	9.5%
Millet	prod (Mt)	924	4267	7006	9412	21019	12749	55377
	% nat. prod.	0.3	1.4	2.3	3.1	6.9	4.2	18.1%
Wheat	prod (Mt)	1574	5521	9526	14835	8592	7326	47373
	% nat. prod.	0.1	0.3	0.5	0.8	0.5	0.4	2.7%
Barley	prod (Mt)	342	216	352	181	171	110	1373
	% nat. prod.	1.0	0.6	1.0	0.5	0.5	0.3	4.0%

In terms of the balance between cereal production and consumption Nuwakot, Sindhupalchock and Gorkha are surplus districts while Rasuwa, Dhading and Dolakha instead are deficit districts<sup>6</sup>, as per table 3 below.

**Table 3. Five-years average of edible food balance - rice, maize, wheat, millet and barley<sup>7</sup>**

	DHADING	DOLAKHA	GORKHA	NUWAKOT	RASUWA	SINDHUP.
Edible food balance (5 years average, Mt)	-13862.8	-18765.6	15996.58	29623.79	-2530.49	21325.07
Rank (over total 75 districts)	63	67	29	14	46	19

Because of the agro-climatic conditions of these districts, the population rely on a diversity of agricultural production. Production per-capita indicates the importance of different non-cereal

<sup>4</sup> Sources: Agriculture Census, 2011, and Population Census, 2011

<sup>5</sup> Source: Agriculture yearbooks 2010-2014, Ministry of Agriculture and Development

<sup>6</sup> Edible food balance calculated accounting for post-harvest losses and seed requirements

<sup>7</sup> Source: Agriculture yearbooks 2010-2014, Ministry of Agriculture and Development

commodities in livelihoods (table 4). Production of certain commodities is also significant at a national level (Figure 1).

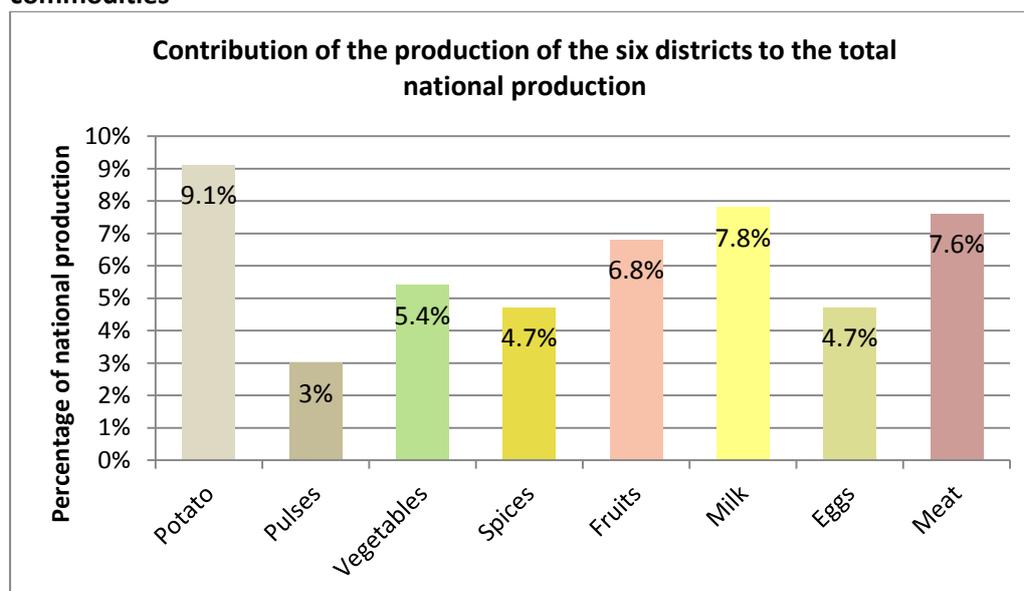
In four of the six districts, per capita potato is well above the national average. Vegetable production is also generally high as is production of meat and milk (see table 4 below).

**Table 4. Per capita production of the six districts compared to national average<sup>8</sup>**

	DHADING	DOLAKHA	GORKHA	NUWAKOT	RASUWA	SINDHUP.	National average
Potato (kg)	75.8	191.3	111.1	233.2	849.4	208.9	161.1
Pulses (kg)	3.7	5.4	13.2	4.5	8.0	11.9	11.9
Vegetables (kg)	224.4	52.6	72.6	140.8	108.8	124.8	126.8
Spices (kg)	10.2	4.1	7.0	16.6	10.8	31.6	18.9
Fruits (kg)	40.8	17.2	93.3	37.6	71.5	33.8	45.8
Milk (kg)	107.9	89.7	63.7	120.5	103.7	86.2	73.0
Eggs (no)	61.3	32.6	0.0	0.0	14.4	29.9	44.0
Meat (kg)	14.3	15.0	15.5	20.7	21.7	14.5	12.7

On a national scale, the role of the districts in production of potatoes, meat and milk is not insignificant, as shown in Figure 1.

**Figure 1. Contribution of the six districts to national production for major agricultural non-cereal commodities**



<sup>8</sup> Source: Agriculture yearbooks 2010-2014, Ministry of Agriculture and Development

### 3. EARTHQUAKE IMPACT: CROPS

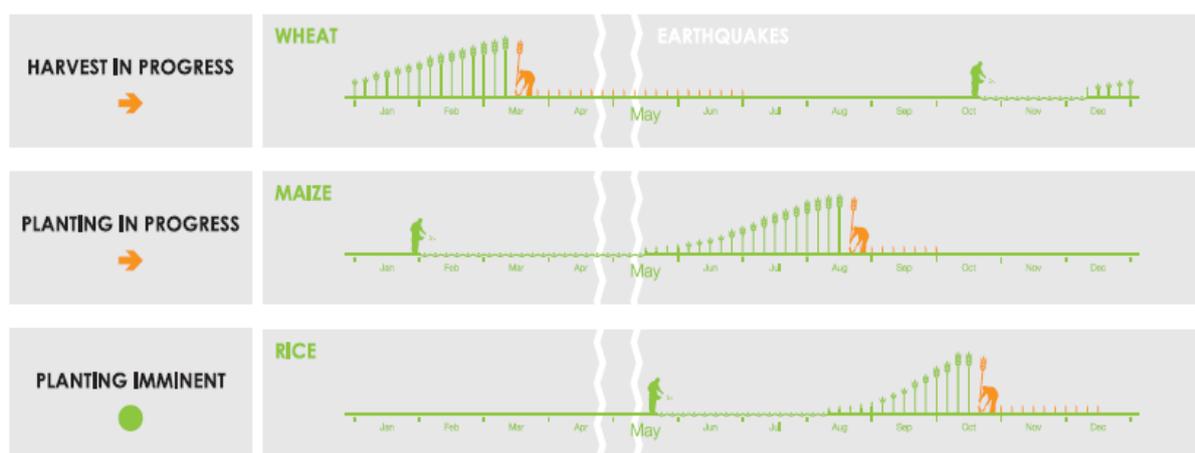
#### Key messages:

- Impact on stored crops is very significant, particularly for rice maize and millet.
- Impact on standing crop is much lower, but can be expected to increase
- Impact on seed availability very significant for rice and millet, posing a real threat to household food security from October onwards

#### 3.1 Introduction

Crop production occupies a key position as a source of food and income in the six districts. Indeed it was cited as a main source of income by 75% of households in the household survey. The April 25 earthquake struck at a particularly important time in the agricultural calendar, as illustrated in Figure 2 below:

Figure 2: Impact of earthquake on wheat, maize and rice (source: FAO GIEWS)



As can be seen, at the time of the earthquake, the wheat harvest was underway. Wheat is an important food source for farming families during the monsoon season (June – September) in the districts hit by the earthquake. It appears that most of the wheat had already been harvested at the time of the earthquake (see section 2.3 below). Depending upon altitude, summer maize planting and/or first weeding was also taking place, and this has been disrupted which will have negative consequences on yields and consequently on household food insecurity from August onwards. Finally, the earthquake came a few weeks before the planting of the main food crop – rice. The most important impact as far as rice is concerned will be in relation to the destruction of rice seed needed for planting, which is normally stored within the house.

#### 3.2 Stored Crop Losses

Data from the household survey confirms that losses of stored crops in the six districts were significant (Figure 3).

**Figure 3: Proportion of losses of stored crop**

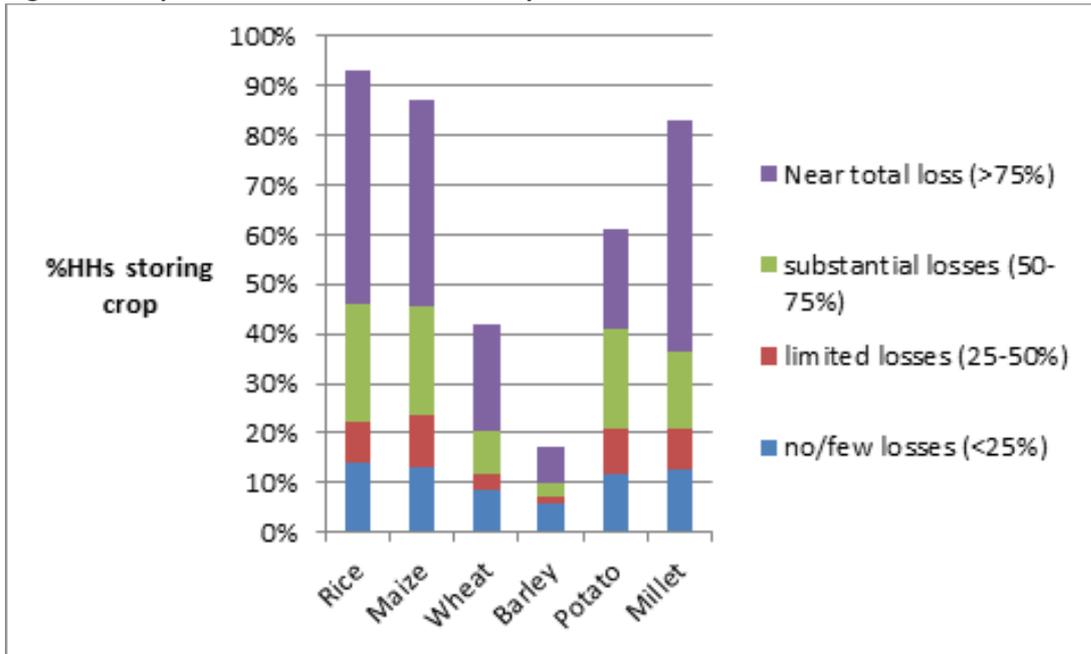


Figure 3 shows that a high percentage of households were storing rice, millet and maize at the time of the earthquake. In addition, about 60% of the households were storing potato. For rice maize and millet, the proportion of households reporting near total loss (above 75% loss) was above 40%.



***Bhakari, traditional bamboo structure used for storing grain inside the house, destroyed in the collapse of the house***

It is important to note that the losses of stored crops were higher in these six districts than in the total eleven districts covered by the sample survey<sup>9</sup>. This is a pattern which is repeated in most other aspects of agriculture.

<sup>9</sup> The household survey took place in eleven of fourteen districts affected by the April 25<sup>th</sup> earthquake. The districts covered by the survey were as follows: Gorkha, Rasuwa, Nuwakot, Dhading, Dolakha, Sindhupalchock, Kabhrepalanchok, Ramechhap, Okhaldhunga, Sindhuli and Makawanpur.

**Table 5: Households reporting a stored crop loss of more than 50%**

	Percentage of households reporting over 50% crop loss	
	In the 6 districts	In the 11 districts
Rice	77%	59%
Maize	73%	43%
Wheat	72%	63%
Barley	56%	49%
Potato	66%	53%
Millet	74%	66%



*Maize recovered from rubble, moulded, unfit for seeding and potentially dangerous for consumption*

### 3.3 Standing crop losses

Standing crop losses appear to be confined mainly to spring planted maize, rice and potato. Losses are also recorded in relation to wheat, although the effect on this crop is lower overall as most households who grew wheat had already harvested it. The main reasons for standing crop losses are: landslides which either destroyed fields or prevented access to them, land cracks in fields and root damage. Further losses have been reported due to hailstorms, and grazing by surviving livestock.

#### **Parbati Shrestha, farmer**

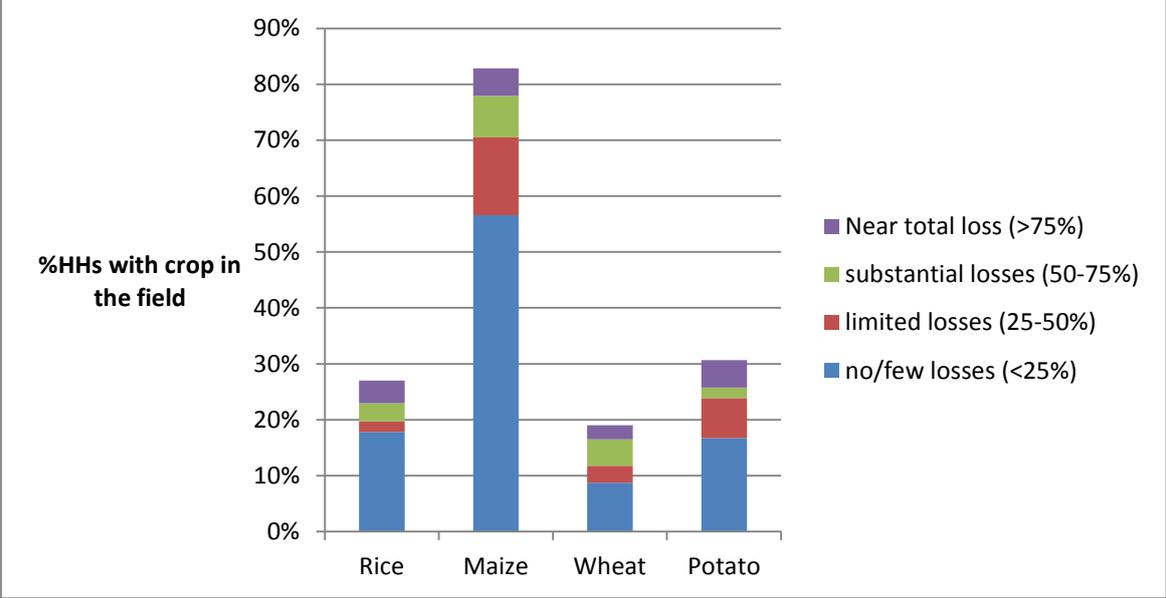
Parbati Shrestha, 43 years old, lives in Tripureshwor VDC of Dhading District with her husband and four children. The earthquake of May 12 destroyed their house. “We ran out in the field and started crying loudly. We were speechless seeing the houses collapsing. My daughter and my husband have been injured, and we are now living in a tent. We had stored 700 KG of rice, 450 KG of millet, and 150 KG of potato, which are now all buried under the rubbles of our house.”

“Standing crops are left without any care, we cannot get chemical fertilizer and seed in the market”, says Parbati. “Everybody in the village lives in fear due to regular aftershocks, and we are dependent on relief distribution. Since the first earthquake we have not slept and eaten properly.”



Whilst currently modest, standing crop losses can be expected to increase because of lack of labour to undertake operations and harvesting. Once harvested, post-harvest losses will be high without proper storage facilities. In the qualitative survey, many VDC Key Informants reported that people had been diverted from farming to other more urgent tasks – chiefly trying to find shelter for themselves and livestock. Finally, there have been several reports of people being traumatised and afraid of venturing out to the fields due to fear of landslides and further tremors.

**Figure 4: Standing crop losses**



*Left: land cracks in Gorkha (source: DADO Gorkha), and right: grain stored outside upon destruction of the house*



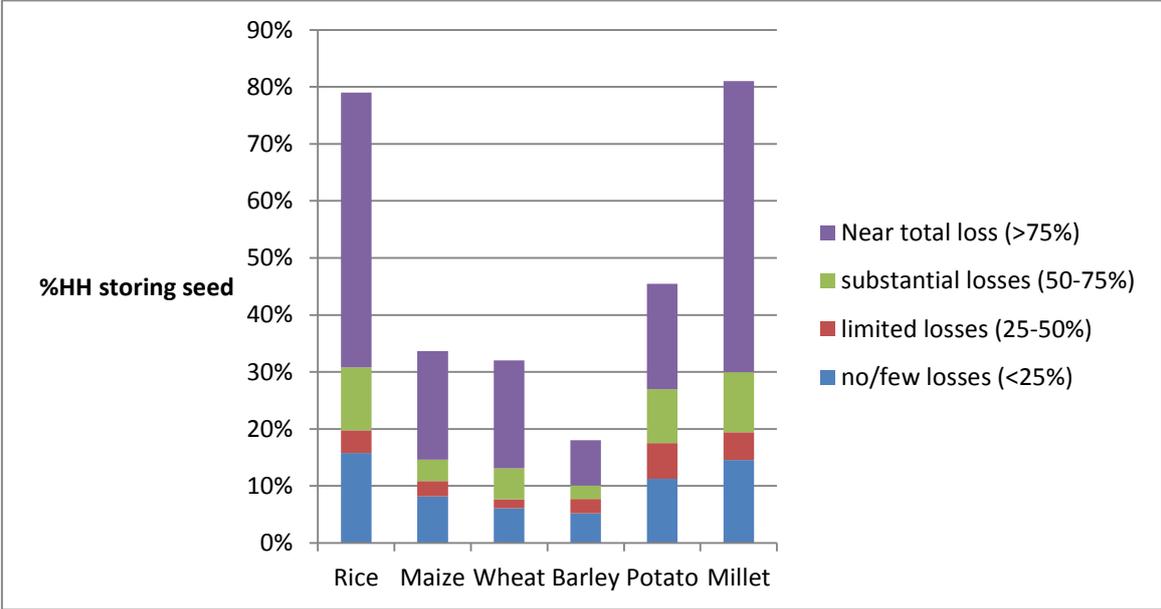
**3.4 Seed losses**

Seed is generally stored in the house near to the stored grain. Therefore as houses collapsed or were damaged after the earthquake seed as well as stored grain was lost.

The proportion of households reporting near total loss of seed is very high for millet and rice. For potato it is lower, with around 45% of households reporting loss, with lower proportions for maize

wheat and barley. When asked, most households reported that seed was not currently available on the market. This raises serious concerns regarding the availability of seed for planting during the summer season and the winter season.

**Figure 5: Seed Losses**



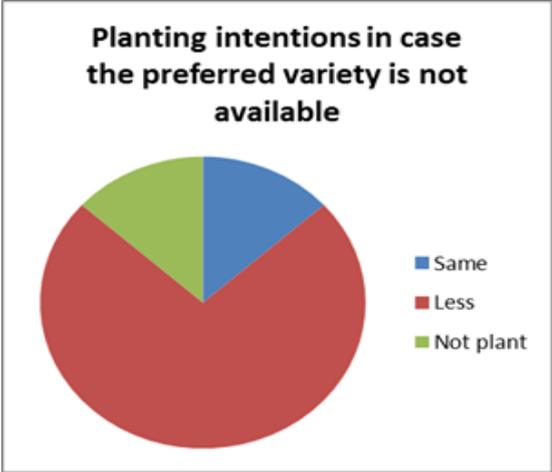
**Sunita Shresta, young mother**

Sunita, 24 years old, lives with her husband and one-month-old baby in Kumpur-3, Dhading District. She gave birth to her first child, a girl, on April 16, nine days before the first earthquake. She had to deliver through caesarian. When the earthquake hit, her husband was out of the house performing daily labour, so she had to run out with her baby before the house collapsed. Sunita's husband says he is aware of the care and nutritious food needed for his wife and daughter, but cannot provide them, as all the food they had was lost in the rubbles of the house, while they now live in a tent. The health of both mother and child is poor, and the baby is suffering from pneumonia. The trauma is still present as Sunita also says, "we still cannot get over the horrible day of the earthquake."



The importance of providing farmers with access to known, preferred and adapted varieties cannot be overemphasized. This is because of the wide degree of variation in altitude and therefore agro-climatic conditions. When asked, key informants were very consistent in stating that if farmers did not have access to known and preferred varieties they would plant smaller areas with unfamiliar varieties, with negative consequences on crop production.

**Figure 6: Planting intentions in summer and winter 2015 if preferred variety is not available.**



### Jeevan Nath Duwadi, farmer

Jeevan Nath Duwadi, 58 years old, lives in Nilkantha Municipality of Dhading District with the seven other members of his family. They are farmers, earning their living from 14 ropani of land. Their house was fully destroyed by the first earthquake and they had to establish their shelter in the fields. They had 3 quintals of maize, 2.5 quintals paddy, 3 quintals of millet and 2 quintals of potato stored in their house, which are now all buried under the rubbles.

“We are trying to recover the grains from the debris” says Jeevan, “but due to regular aftershocks we cannot go inside, so we are waiting for the army officers to help and extract the grains, but they are still busy with relief work and have not come yet. The vegetables garden was also damaged, and all the agricultural tools are buried in the house. All the grains that were kept for seeding are mixed with the mud and lost. We are looking for an organization that can provide us with seeds, otherwise we will not be able to cultivate paddy in coming monsoon. We would then have to purchase rice from the market, but although we are a middle class family, it will be difficult for us to buy.”



### 3.5 Kitchen gardens

Existing kitchen gardens have been destroyed in many cases due to their close proximity to collapsed housing as well as establishment of shelter and trampling. According to most key informants, there appears to be opportunities for re-establishment of vegetable growing in earthquake affected areas, with the main constraints reported being the lack of seeds and inputs. From a nutritional point of view, this would be an appropriate response to increase vegetable consumption which appears to have been significantly reduced since the earthquake<sup>10</sup>.

---

<sup>10</sup> In 12 out of 18 VDCs visited in the qualitative assessment, key informants indicated that vegetable consumption had reduced to a significant extent, and in 2 VDCs it was reported that vegetables were no longer being consumed at all.

# 4. EARTHQUAKE IMPACT: AGRICULTURAL TOOLS, FERTILIZERS AND LABOUR

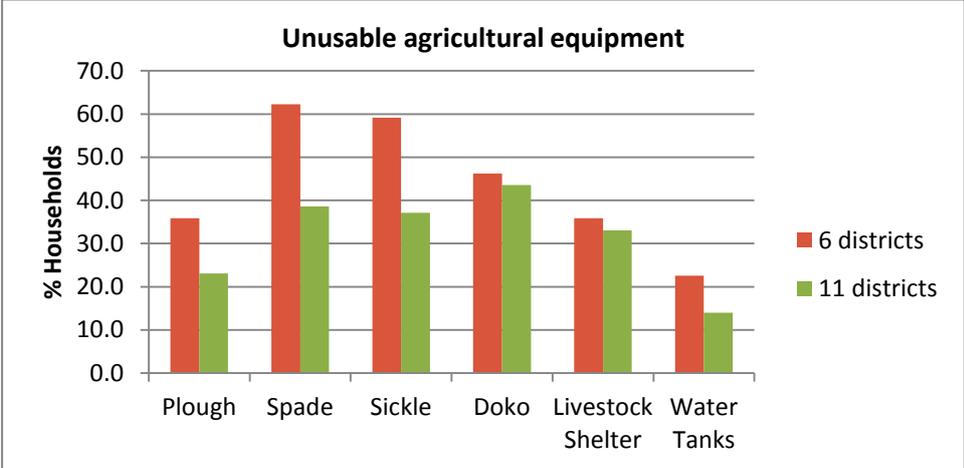
## Key messages:

- The proportion of agricultural tools destroyed is particularly high in the six districts, and this will seriously reduce capacity for cultivation.
- Loss of livestock shelters and water tanks puts the health and safety of surviving animals at risk.
- Household access to fertilizer reduced, further threatening production prospects in the summer cropping season.
- A steep reduction in labour availability for agriculture is apparent as households struggle to meet more urgent shelter needs for themselves and their livestock.

### 4.1 Tools and Equipment

Damage to and destruction of agricultural assets is significant. Key tools lost or rendered unusable include ploughs, spades, sickles and dokos. In addition, livestock shelters and water tanks for livestock were also destroyed. The level of destruction is shown in Figure 7 below. Due to the severity of the earthquake in the six districts, agricultural asset loss was reported by a higher percentage of households than in the 11 districts as a whole.

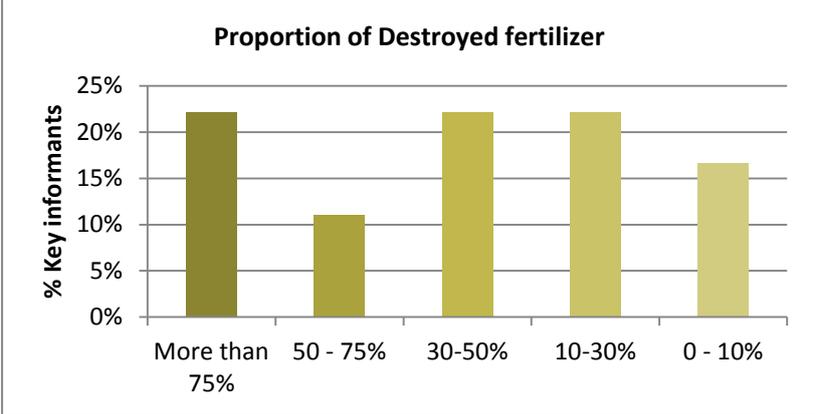
Figure 7: Unusable Agricultural equipment



### 4.2 Fertilizers

Losses of chemical fertilizers stored in or near the house were reported by VDC level key informants as being significant (Figure 8). At the time of the qualitative field survey, fertilizers were reported to be available (in the market and in farmer cooperatives) in the VDCs visited in Dhading, Nuwakot and Gorkha, and not available in Sindhupalchock and Dolokha. Use of fertilizers for summer planted crops is very common and necessary for good yields. The loss of livestock which provides manure for fertilizing the crops will exacerbate the problem in the coming weeks and months.

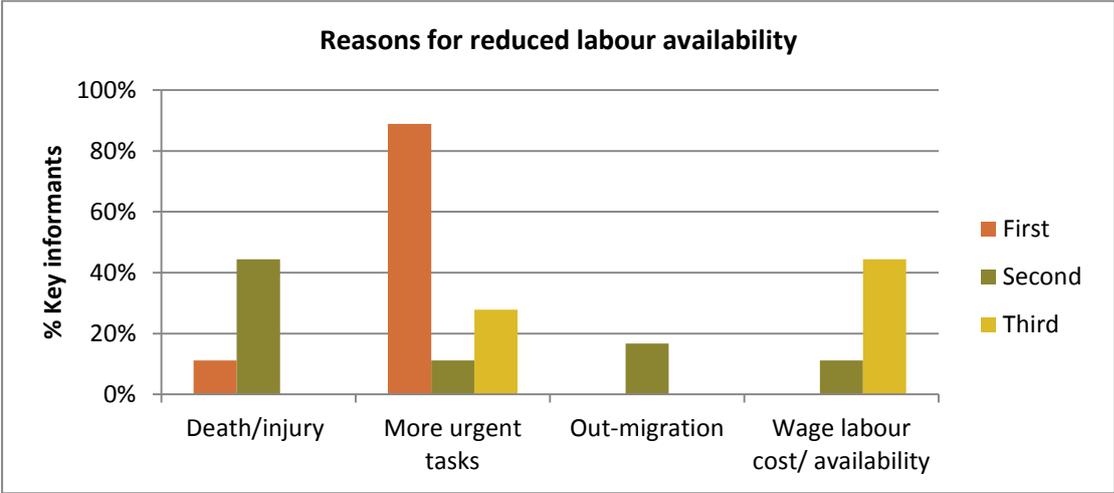
**Figure 8: Fertilizer losses**



**4.3 Labour**

The earthquake has had a major effect on reducing labour availability for agricultural tasks. In VDC level discussions, it was clear that an important reason for this was that household members were too busy trying to find shelter for themselves and their livestock as well as being in a state of shock. Death and injury of household members was another factor, as well as unavailability of the persons usually providing wage labour and consequent increase in wage rates (Fig 9).

**Figure 9: Reasons for reduced labour availability due to the earthquake**



## 5. EARTHQUAKE IMPACT: LIVESTOCK

### Key messages:

- Livestock ownership is a major contribution to agricultural livelihoods and widespread with 80% of households owning some animal but in limited numbers.
- Animal losses due to the earthquake are significant with 20% for cattle and 42% for poultry and more animals injured and sick, and animal health is at risk due to lack of shelter and feed and limited access to veterinary services.
- Production of animal products has been reduced due to stress syndromes, lack of feed and deteriorated health conditions. This affects households both for own consumption and income earning.

### 5.1 Introduction

Livestock ownership is significant in Nepal and particularly in hills and mountains, where it is a major component of livelihoods both as source of food and income. As shown in table 6 below, the proportion of households owning livestock is generally a little higher in the six districts than in the eleven districts as a whole.

**Table 6. Livestock ownership before the earthquake**

	Households owning animals before the EQ	
	Overall in the 11 districts	Specifically in the 6 districts
Cattle	72%	84%
Oxen	35%	35%
Sheep and goats	70%	75%
Poultry	57%	65%

### 5.2 Livestock deaths

Reports on the loss of livestock are currently being conducted and compiled by the District Livestock Services Offices. According to the data compiled so far in the six districts, it appears that livestock deaths are in proportion much higher Sindhupalchock and Rasuwa (see Table 7).

**Table 7. Animal deaths from DLSO reports**

District	Animal deaths (in % of total population)		
	Large	Small	Poultry
Nuwakot	0.9	2.7	1.5
Sindhupalchock	3.8	8.4	19.4
Rasuwa	2.0	6.5	21.4
Dhading	1.0	2.1	9.3
Dolakha	0.1	0.3	2.1
Gorkha	0.6	1.4	1.9
<b>Total</b>	<b>1.3</b>	<b>3.3</b>	<b>6.9</b>

Overall these numbers indicate a fairly low proportion of animal deaths, however these numbers are not an estimate of overall animal losses, but rather compilation of losses being reported. The data from the household survey is therefore felt to be more accurate to provide an estimate of overall animal losses so far, until reports from DLSO are complete.

Data from the household survey indicate a significant loss of livestock (Table 8). Applying this household data to the overall animal population in the six districts also provides an estimate of the number of animal lost. Some of this reduction might be due to indirect effects of the earthquake such as subsequent death from illness as the survey was led in mid-May. Reductions due to sales and increased consumption appear highly unlikely.

**Table 8. Livestock reductions in six districts due to the earthquake as reported in the household survey**

	Percentage reduction	Minimum estimated animal loss <sup>11</sup>
Cattle	16.3%	168,774
Oxen	2.6%	1652 <sup>12</sup>
Sheep and goats	4.4%	38,426
Poultry	36.6%	1,282,973



The numbers of households directly affected by these losses vary according to the type of livestock lost. Overall the proportion of households affected by loss of oxen appears light, with just 12% of those households which owned oxen reporting losses. In the case of cattle the figure was 15%; for sheep and goats 15% and for poultry 38%<sup>13</sup>.

Livestock are commonly kept either on the ground floor of the house, or under a specific shelter next to the house, or tied outside along the house. Thus, many animals were killed as houses or shelters collapsed - this is particularly the case for cattle which would explain the higher loss. Poultry is also kept in specific constructions, especially for larger farming, which resulted in higher loss.

**Left: Carcass of a buffalo being extracted from rubbles**

**5.3 Livestock injuries and illness**

Reports from the qualitative assessment at VDC level indicate very diverse proportion of animals being injured or sick, mostly higher than the proportion of animals killed, but this would require further investigation. Overall but with some exceptions, the level of veterinary support was reported to be very limited by VDC Key Informants. It was reported that in the vast majority of cases livestock carcasses were being properly buried, reducing concerns over infections and diseases due to rotting carcasses. This will be confirmed as data is being compiled by the District Livestock Support Officers. In addition severe stress syndromes have been reported among livestock due to the trauma,

<sup>11</sup> These figures were calculated by computing the 95% confidence interval around the estimates generated in the survey, taking the lowest value in each case and applying this to official pre-earthquake livestock figures. Thus, on the assumption that the sampling was properly random and that answers given to the questions are truthful, we can have 95% confidence that the losses per animal are no lower than the numbers reported in the table.

<sup>12</sup> This figure does not include losses from Gorkha.

<sup>13</sup> A small minority of households (around 5%) reported losing all their livestock.

resulting in abortions, disturbed eating behaviour, and even mortality during subsequent shocks. There is therefore a real risk of further livestock mortality due to both injuries inflicted during the earthquake and subsequent degradation of living conditions.

#### ***Injured animals in Nuwakot and Dhading***



#### **5.4 Shelter, Feed and Water**

A critical concern is the lack of shelter. Overall, 36% of households report that their livestock shelter was destroyed. As an emergency solution and when available, households are using tarpaulins to protect livestock. However when the monsoon comes, these temporary shelters might not hold and would not be sufficient to protect animals. Animals deprived of shelter are also more exposed to predators and an increase in loss of animals due to attacks by tigers and leopards has been reported.

#### ***Temporary shelters for livestock in Nuwakot and Gorkha***

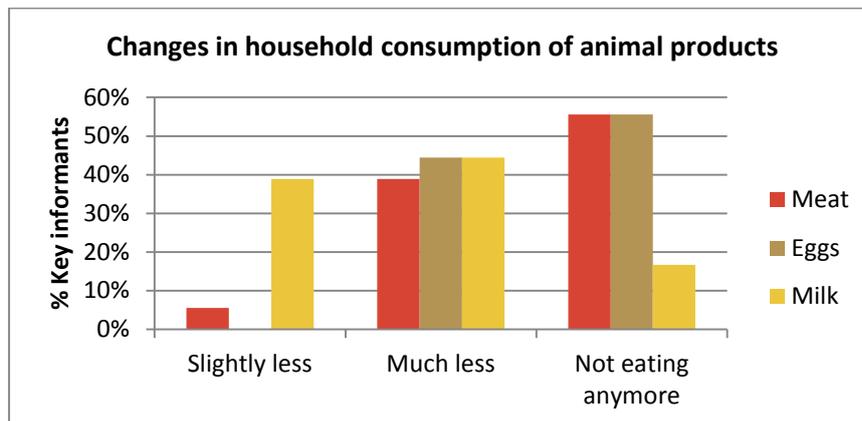


As livestock is mostly kept next to the house instead of grazing, it is usually fed with grain, mostly maize and rice bran, stored in the house together with all cereal stocks. Thus the large losses of stored grain will have a direct negative impact on availability of livestock feed. Some grain is being recovered from collapsed buildings and fed to livestock, however, after weeks in the mud this is becoming mouldy and therefore carries the risk of ingestion of aflatoxins, which poses risks to animal health and human health if animal products are consumed. In addition, access to forest areas to collect fodder for animals has also been reduced by landslides, road blockages and fear of aftershocks – almost half (47%) of households reported that they no longer had access to forest resources as a result of the earthquake. As noted earlier, the household survey found that availability of water for livestock has also been reduced, as water tanks for livestock have been destroyed. This was confirmed by Key Informants who further explained that water systems had been damaged and some sources had dried up due to the earthquake.

## 5.5 Nutritional Impacts

The deaths, injuries, trauma and deteriorating health conditions of livestock, together with reduced slaughter of animals in a period of mourning has led to dramatically reduced consumption of animal products. This was reported by all the VDC level Key Informants with the majority reporting eating much less meat, milk and eggs, and in some cases complete cessation in consumption of these products, as shown in Figure 10 below.

**Figure 10: Change in consumption of animal products since earthquake**



### Shova Rimal, cattle farmer

Shova Rimal, 32 years old, lives in Tripureshwor VDC of Dhading District with her husband and two children. Their major occupation is agriculture and commercial livestock rearing with 25 milking cows. When the first earthquake of 7.8 RS came, their house was totally destroyed, together with the grain stored and all their personal belongings. Fortunately the cow shed stood and no cow was killed, so they are now living there with the 25 cows. Shova in their collapsed house trying to recover some belongings from the rubbles when the second earthquake hit on May 12, she ran out and felt down, fracturing her leg. Now she has to depend on her neighbour for support in food and daily tasks, but as the neighbours is also busy with managing her shelter, she cannot bring the food regularly.



“It became very difficult for us”, says Shora. “The feed for the cows is now finished, and we cannot climb on the hills for fodder due to uncertain hits of earthquake. The cattle is losing weight, and is also very stressed since the earthquake, so the milk production has decreased. One of my cows has also aborted.”

“We are still under shock since the earthquake. Many people and animals died in our village. We are unable to carry our usual activities, like earthing up and fertilizing the maize field. It is certain the production will be lower this year.”

# 6. EARTHQUAKE IMPACT: IRRIGATION AND AGRICULTURAL INFRASTRUCTURE

**Key messages:**

- If not repaired quickly, damage to small-scale irrigation will have significant negative consequences on crop production in the winter cropping season.
- Damage to Agricultural and Livestock Service Centre buildings and facilities will seriously affect the ability of extension staff to provide technical services to farmers.

Irrigation is important in spring, summer and winter seasons. In summer it is used to irrigate rice at the start of the monsoon, whilst in the winter season it is necessary for wheat, hybrid maize, barley, buckwheat and potato in critical growing periods (e.g. crown initiation tillering and flowering in wheat) and in the spring it is used for spring rice and spring maize.



*Maize crop lacking irrigation in Dhading*

The results of the household survey indicate that a sizable minority (36%) of households in the six districts use irrigation, compared to 25% in the 11 districts overall. The extent of damage to small-scale irrigation infrastructure is shown in table 9 below.

**Table 9: Impact of the earthquake on irrigation infrastructure**

	6 districts	11 districts
Less than 25%	14%	30%
25 - 50%	13%	14%
50 - 75%	37%	29%
Above 75%	37%	27%

Many Agriculture and Livestock Service Centers have been severely damaged or destroyed, affecting their capacity to provide services to farmers. MoAD reports indicate that well over 30 Service Centre

buildings across the 6 districts have been completely destroyed with the same number again seriously damaged. These figures do not include Sindhupalchock and only partly include Dolakha, thus the numbers will certainly rise. In addition, agricultural infrastructures such as chilling centres, seed stores and processing plants, and cooperative buildings across the six districts have been completely or partly destroyed.



*District Agriculture Development Office destroyed in Nuwakot*

# 7. AGRICULTURAL LIVELIHOOD SUPPORT NEEDS AND IMPLICATIONS FOR RESPONSE

**Key messages:**

- Agriculture is highly feminized due to high rates of male migration. Over a quarter of households in the six districts are headed by women and are more likely to engage in erosive coping strategies.
- The immediate needs are seeds and fertilizers for the summer crops while irrigation will become increasingly important for the winter crops. Shelter and feed are the most important needs for livestock, followed by medicine and vaccination.
- The earthquake has increased vulnerability to existing hazards as well as the risk of hazards occurring such as landslides. Resilient livelihood recovery should entail reducing vulnerability of households to these more frequent hazards.

## 7.1 Some issues to be taken into account in the response

### Gender issues and the feminization of agriculture

The number of female headed households in Nepal is high by South Asian standards. As shown in Table 10 below, about one quarter of households are headed by women.

**Table 10: Proportion of female headed households per district**

District	% of Female-headed Households
Sindhupalchowk	24%
Nuwakot	21%
Dhading	28%
Rasuwa	22%
Gorkha	37%
Dolakha	34%
<b>Total</b>	<b>26%</b>

In responding to the support needs brought by the earthquake, it will be critical to factor in the fact that agriculture in the six districts as in Nepal in general is highly feminised. High rates of male migration have left women in charge of many farming operations that used to be shared or carried out by men<sup>14</sup>. Women contribute to 60% of the agricultural economy; whilst men contribute 40%<sup>15</sup>. Concerning livestock; 70% of females are employed in the sector in contrast with 50% for males.

At the same time, male migration has led to significant proportions of land being abandoned due to lack of labour. As has been seen earlier in this report, one of the consequences of the earthquake has been less labour availability for agriculture than usual. Thus already labour constrained farming systems will have been put under further strain. These labour constraints and the need not to exacerbate them, should therefore be at the forefront of response strategies.

Women are responsible for seed management in the household. Thus any interventions aimed at increasing seed availability in both summer and winter seasons should be tailored to women, including extension services. In addition, there should be special targeted support to women made

<sup>14</sup> In 2009, 72.8% of economically active (age 10 and over) women were engaged in agricultural work compared to 60.2% for men. In 2012, a study by ICIMOD found that on average women carried out 6.3 to 6.6 times the agricultural work that men carried out.

<sup>15</sup> CBS Population Monograph of Nepal Vol III (2014)

widows by the earthquake who can now not access to information and technology credit and inputs, which was being accessed by their husband. Women are also responsible for livestock management. The loss of livestock could have a devastating effect on women as livestock is one major source of independent income for women, particularly goats, pigs and poultry that are often given to them as a gift. As for seeds therefore, livestock interventions should be tailored to women.

Analysis undertaken by WFP clearly indicates that post-earthquake, female headed households have a lower food consumption score in earthquake affected districts than male headed households, and they are also more likely to be engaging in erosive coping strategies<sup>16</sup>. This further adds to the argument for giving priority to these households in response strategies.

**Hazards and vulnerabilities**

The earthquake has made households more vulnerable to existing hazards, and has generated new ones. The threat of landslides has increased significantly, whilst at the same time the ability to deal with them has decreased. Outbreaks of army worms have been reported in Dolokha and Gorkha districts, attacking cereal crops, particularly the standing maize crop. How can households be assisted to deal with this pest in a post-earthquake situation? A further threat is the prospect of below normal rainfall in the upcoming monsoon, which re-emphasises the need for speedy rehabilitation of irrigation systems.

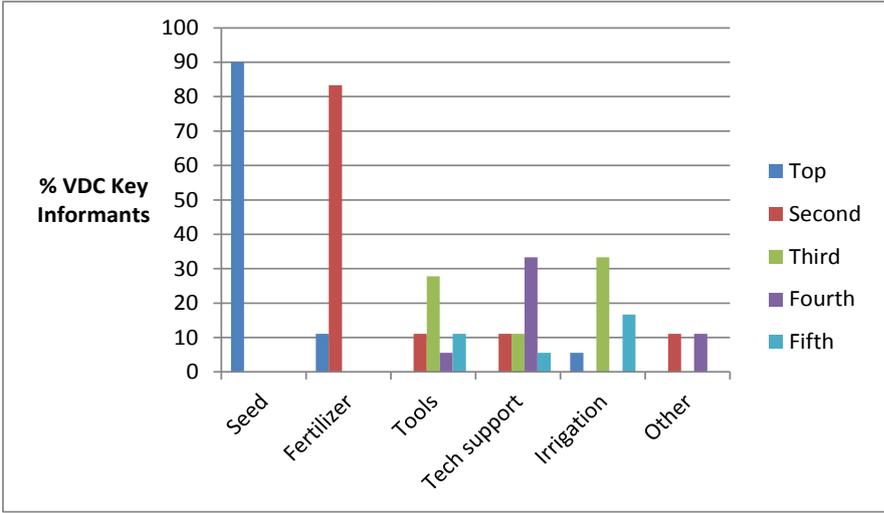
All of these issues should be taken into consideration as the expressed needs of farmers are met.

**7.2 Crop Needs**

**Immediate Needs**

The most critical needs for the summer cropping season expressed by Key informants are clearly seeds and fertilizers, followed by irrigation, tools and technical support. The window for planting rice has almost closed, however there is still time to provide millet and vegetable seeds (see district specific seasonal calendars in annex).

**Figure 11: Immediate needs for crops**



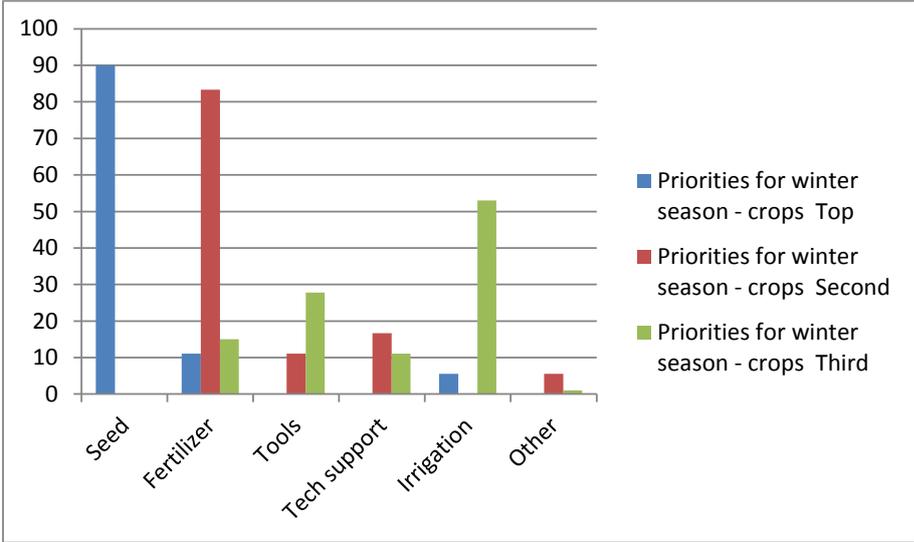
**Needs in 3 – 6 Months**

The winter cropping season will start in October for winter wheat and barley. As household seed stocks have been lost, access to seeds will need to be supported. Indeed, seed is still expected to be

<sup>16</sup> Report on the food security impact of the 2015 earthquake, May 2015, WFP-FSC-NeKSAP

the most critical need in relation to the winter cropping season (see figure 12 below). Need for fertilizer support was also clearly signaled by Key Informants. Use of both chemical fertilizers and manure is common. With reduced quantities of manure from livestock, farmers will have an increased need for chemical fertilizers, however their ability to afford these will be compromised due to reductions in income<sup>17</sup>. Agrovets shops that were closed are gradually reopening therefore there is an opportunity to support access through cash or vouchers programmes. Rehabilitation of irrigation will be a critical need for the winter cropping season, and this is reflected in the increased importance given to it compared to the immediate priorities.

**Figure 12: Priorities for winter cropping season**

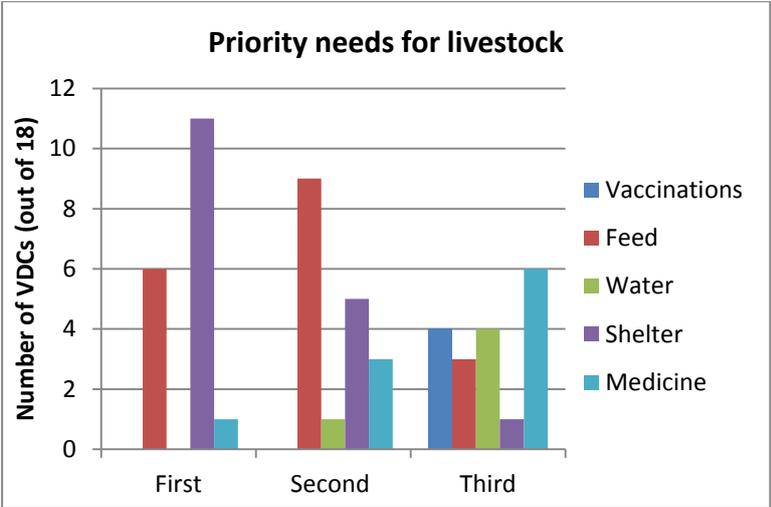


**7.3 Livestock needs**

**Immediate needs**

The most urgent need as expressed by Key Informants is shelter, followed by feed, medicine and vaccinations, and water. As noted earlier, many livestock water sources have been destroyed or badly damaged.

**Figure 13: Needs for livestock in June - August**



<sup>17</sup> Over 40% of households reported a reduction of more than 30% in income from crop production and 33% from livestock after the earthquake.

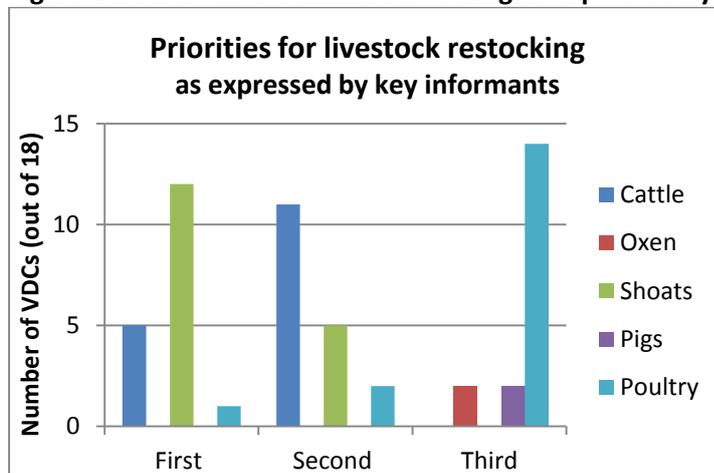
### Needs beyond the next three months

Recovery of shelter, feed access and water sources will need to continue beyond the next three months. As maize and paddy are substantial composition of animal feed, since the harvest of these two summer crops will likely be lower than usual, availability of feed from household production might continue to be an issue over the next months.

Restocking of livestock will become necessary and appropriate once the health conditions of surviving animals can be guaranteed and households can access sufficient feeding. Restocking could be seen as an opportunity to improve animal production with introduction of more productive breeds.

Key informants were consulted on priorities for restocking and reported sheep and goats as the first priority because of their importance for income generation through meat production. Cattle was the second priority as being both a source of income and food through milk production. Poultry was third most important, while oxen do not appear to be a priority, probably both as fewer households own oxen, these animals have been relatively less affected, and these animals can be borrowed.

**Figure 14. Priorities for animal restocking as expressed by key informants from VDCs**



### 7.4 Resilient Livelihood Recovery

In meeting the agricultural needs of communities, interventions should be phased and designed appropriately to support and promote resilient livelihood recovery. This implies to not only focus on the effects of this earthquake but rather have a comprehensive approach to reduce the vulnerability of households to other more frequent hazards, such as landslides, floods, droughts, pests and diseases.

The following table gives some examples of what kinds of responses will be required over the coming months.

## RESILIENT LIVELIHOOD RECOVERY

Indicative interventions to support recovery and build resilience of agricultural livelihoods affected by the earthquake

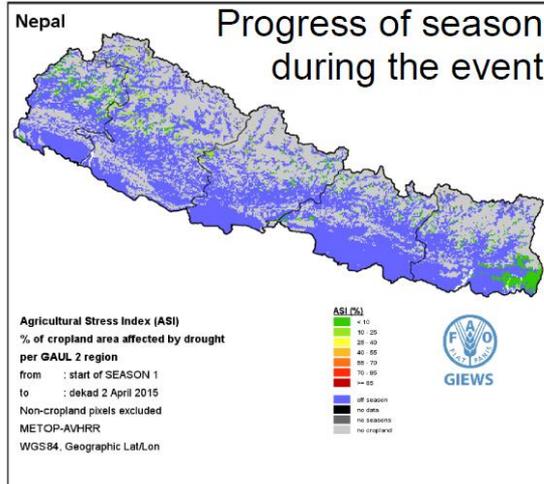
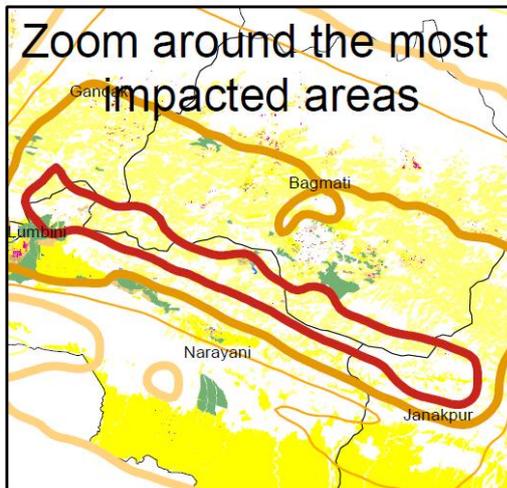
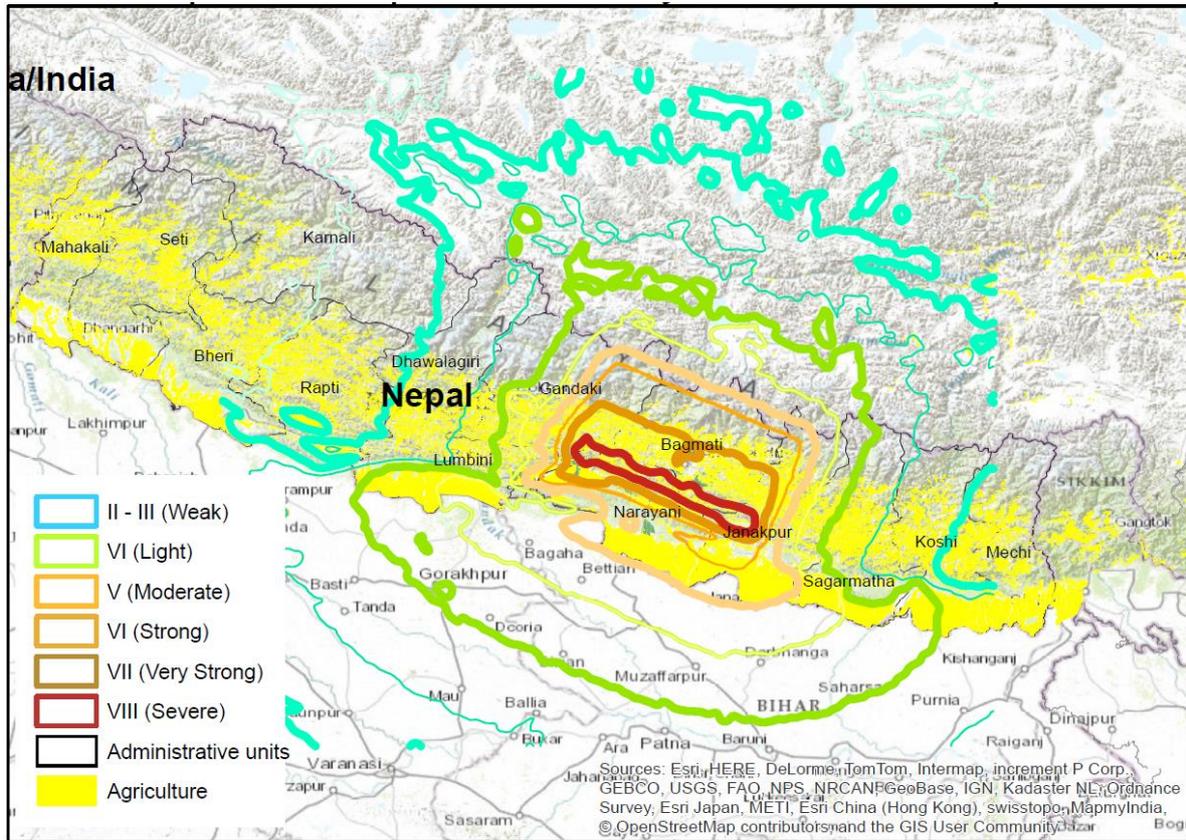
	Preserving livelihoods	Recovering livelihoods	Building back better and sustainable livelihoods
<b>Crop production</b>	2015 Summer cropping season, June-September: rice, maize and mill	2015-16 Winter and spring cropping seasons, October-May: wheat, barley and potato	2016 Summer cropping season, May-October (rice, maize and mill) and beyond
	Direct distribution of seeds, tools and fertilizers, as well as super grain bags for grain storage	Distribution of seeds and fertilizers through cash and vouchers, possibly through Agrovet shops, and super grain bags for storage as necessary Seed multiplication, possibly through women associations	Distribution of seeds through cash and vouchers Crowdsourcing and multiplication of rare varieties Technical support for improved cropping practices, Integrated Pest Management and adequate use of fertilizers for reduced production costs Increase in use of manure for fertilization through restocking of livestock
<b>Livestock</b>	Summer and winter 2015-2016	Spring 2016	Summer 2016 and beyond
	Direct distribution of animal feed Provision of veterinary services Distribute emergency material (tarpaulins) for temporary livestock shelter	Distribution of complementary animal feed through cash and voucher programmes, and support to feed production Distribution of material for rehabilitation or reconstruction of animal shelter (iron sheets), through cash and vouchers schemes	Restocking of animals (for households who have already rebuilt shelter and recovered capacity to access feed) with introduction of improved adapted breeds Continued support to feed production through crop and agroforestry (in synergy with land stabilization) Technical support for improved breeding practices
<b>Irrigation</b>	Summer cropping season 2015	September 2015 – for winter cropping season	Summer 2016 and beyond
	Distribution of plastic pipes for fast rehabilitation of small irrigation schemes	Rehabilitation of irrigation infrastructures, possibly through cash for works programmes	Improve and extend access to irrigation especially in areas subject to drought
<b>Land stabilization and adaptation</b>		Winter 2015 and beyond	
		Stabilization of forest slopes at risk of landslides by planting a combination of fast-growing and deep-rooted trees, through cash-for-work programmes Stabilization of cultivated plots at risk of landslides and erosion by planting deep rooted trees (also providing fodder) through cash-for-work and technical support Technical support to assess change in cultivation of land damaged by the earthquake (ruptures and quakes, soil liquefaction) for different crops or fruit trees	

<b>Community infrastructures</b>		Winter 2015-Spring 2016	Summer 2016 and beyond
		Rehabilitation of agricultural infrastructures such as seed multiplication plants, mills and processing plants, through community-based cash for work or support to producers organizations	Improve access to remote agricultural areas by construction of rural tracks through community-based cash-for-work programmes
<b>Kitchen gardens</b>	Summer 2015	Winter 2015-Spring 2016	Summer 2016
	Direct distribution of seeds	Distribution of seeds through cash and vouchers Seed multiplication, possibly through women associations	Technical support on vegetable gardening and home nutrition through women groups
<b>Cash crops</b>		Winter 2015	Summer 2016 and beyond
		Support recovery of cash crops (fruits, nuts, ginger, spices, potato) and bee keeping production	Support to development of cash crops (fruits, nuts, ginger, spices, potato) and bee keeping, production, processing and marketing
<b>DRR</b>			Reduce vulnerability to drought through irrigation schemes and rainwater harvesting Reduce vulnerability to flood through community-based construction of check dams and river banks Reduce vulnerability to landslides through bioengineering and stabilization of slopes Reduce vulnerability to pests and production costs through IPM

## Annexes

- Annex 1: Nepal earthquake intensity and extent map
- Annex 2: Map of VDCs visited for Qualitative Fieldwork
- Annex 3: Map of VDCs sampled in Household Survey
- Annex 4: District agricultural profiles

**Annex 1. 2015 Nepal earthquake intensity and extent map (source: FAO GIEWS)**



On April 25, 2015 at 11:56 NST a violent earthquake occurred in Nepal with a magnitude of 7.8 (Mw) and with a maximum Mercalli Intensity of IX (Violent). The epicenter was around 35 km east-southeast of Lamjung, Nepal. This was one of the most power disaster to strike Nepal since the 1934 Nepal-Bihar earthquake causing thousands of casualties in the population and many damages in various sectors including agriculture. FAO Land and Water Division, Geospatial unit prepared the map and analysis to indicate potential damages in the agriculture sector including agriculture, forestry and fisheries. The preliminary analysis indicates that most of the agriculture areas are currently off season in terms of vegetation growth and the ones that had initiated the growing season appeared to be in good vegetation health condition at the time of the event.

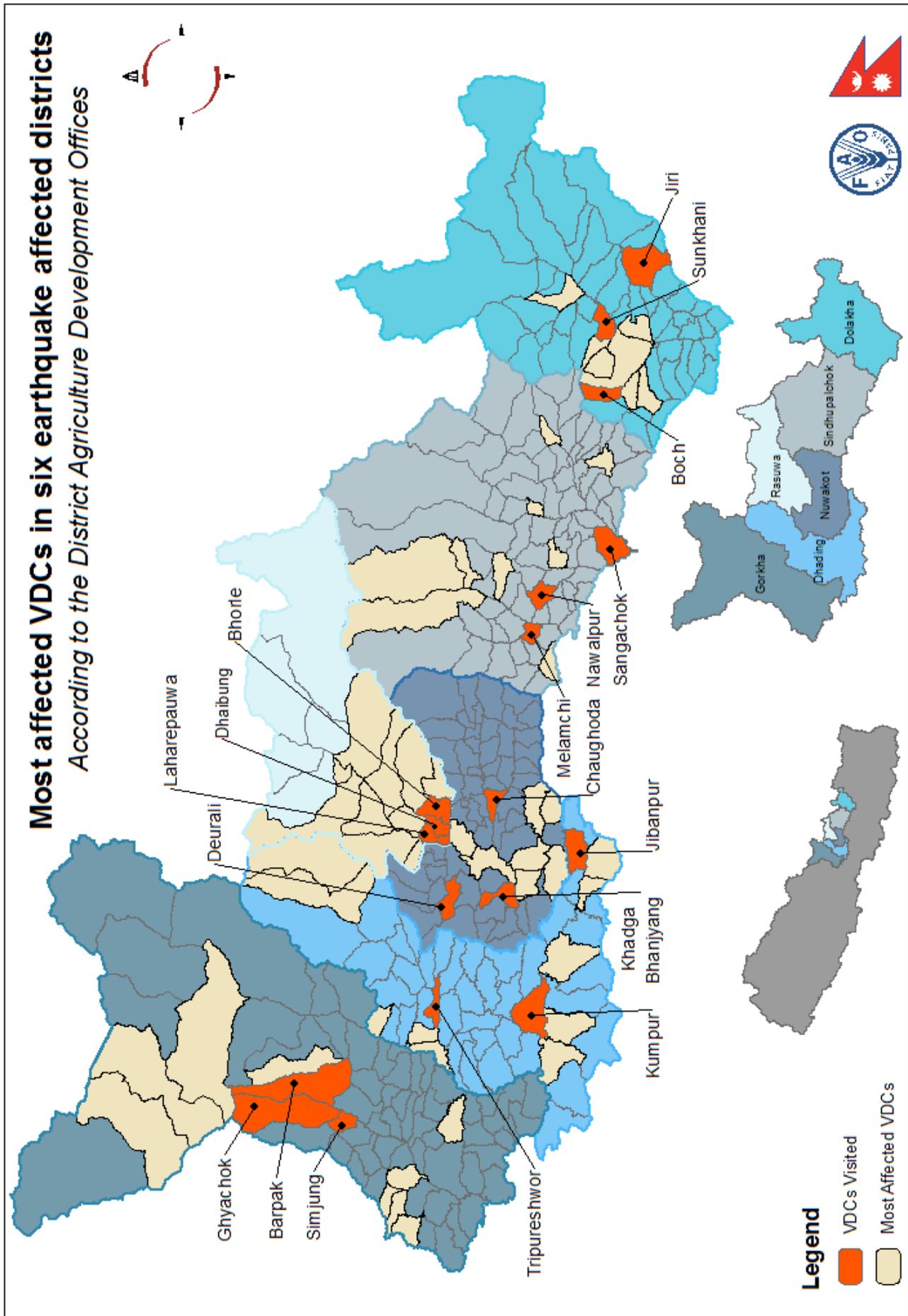
Data sources include cropland extend derived by FAO Himalayan land cover change database, GIEWS ASIS data, Global Administrative Units Layer (GAUL 2015/14) ([www.fao.org/geonetwork](http://www.fao.org/geonetwork)), Earthquake extent, [http://earthquake.usgs.gov/earthquakes/eventpage/us20002926#impact\\_shakemap](http://earthquake.usgs.gov/earthquakes/eventpage/us20002926#impact_shakemap) and Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community.

Prepared by Renato Cumani, FAO Land and Water Division (NRL) and FAO GIEWS (EST) on April 25 2015

The designations employed and the presentation of material in this information product do not imply the expression of any opinion whatsoever on the part of FAO concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.



Annex 2: Map of VDCs visited for Qualitative Fieldwork





#### Annex 4. Net and per capita production and national rank for main non cereal commodities, 2014

Data from MoAD. Highlights indicate where the rank of the net or per capita production of the district is in the first third out of total 75 districts in Nepal.

		GORKHA	SINDHUPALCHOK	RASUWA	DOLAKHA	NUWAKOT	DHADING
Potato	Prod. (Mt)	29924	60480	37200	36000	65000	25487
	Prod. rank	32	11	23	25	10	38
	Per cap (kg)	111	209	849	191	233	76
	Per cap. rank	32	17	3	20	15	40
Pulses	Prod. (Mt)	3564	3451	352	1024	1250	1232
	Prod. rank	25	27	70	52	46	49
	Per cap (kg)	13	12	8	5	4	4
	Per cap. rank	20	24	39	50	60	64
Vegetables	Prod. (Mt)	19553	36110	4764	9906	39248	75458
	Prod. rank	47	31	66	58	30	17
	Per cap (kg)	72.6	124.8	108.8	52.6	140.8	224.4
	Per cap. rank	53	27	35	63	20	8
TOTAL spices	Prod. (Mt)	1878.8	9136	474.67	765.16	4618.3	3438.9
	Prod. rank	45	16	64	60	28	33
	Per cap (kg)	7.0	31.6	10.8	4.1	16.6	10.2
	Per cap. rank	46	12	34	57	22	36
Cardamom	Prod. (Mt)	30	16	0	38.16	20.3	4.6
	Prod. rank	14	17	60	13	16	25
	Per cap (g)	111.4	55.3	0.0	202.8	72.8	13.7
	Per cap. rank	14	19	40	11	15	29
Ginger	Prod. (Mt)	1207.5	5598	222	475	2630	3075
	Prod. rank	39	15	54	47	26	23
	Per cap (kg)	4.5	19.3	5.1	2.5	9.4	9.1
	Per cap. rank	38	16	36	46	24	25
Garlic	Prod. (Mt)	165	2038	94.86	120	438	69
	Prod. rank	51	5	60	57	26	63
	Per cap (kg)	0.6	7.0	2.2	0.6	1.6	0.2
	Per cap. rank	57	4	17	56	29	64
Turmeric	Prod. (Mt)	300	1457	69.81	72	400	96.3
	Prod. rank	38	12	61	60	34	57
	Per cap (kg)	1.11	5.03	1.59	0.38	1.43	0.29
	Per cap. rank	36	10	26	57	28	60
Chilli	Prod. (Mt)	176.3	27	88	60	1130	194
	Prod. rank	33	60	45	52	7	32
	Per cap (kg)	0.65	0.09	2.01	0.32	4.05	0.58
	Per cap. rank	35	61	14	49	7	37
TOTAL fruits	Prod. (Mt)	25143	9791	3131	3229.4	10486.3	13712.5
	Prod. rank	6	38	65	63	32	25
	Per cap (kg)	93.3	33.8	71.5	17.2	37.6	40.8
	Per cap. rank	4	42	10	62	36	33
Citrus	Prod. (Mt)	8627	2611	470	2629.9	2478.3	4602.5
	Prod. rank	7	31	50	30	33	20
	Per cap (kg)	32.0	9.0	10.7	14.0	8.9	13.7
	Per cap. rank	10	34	32	28	35	29

Deciduous fruits	Prod. (Mt)	2352.2	3950	2145	316.5	1011	1872
	Prod. rank	18	6	21	55	43	24
	Per cap (kg)	8.7	13.6	49.0	1.7	3.6	5.6
	Per cap. rank	26	18	5	54	45	37
Tropical fruits	Prod. (Mt)	14163.8	3230	516	283	6997	7238
	Prod. rank	13	38	61	64	24	23
	Per cap (kg)	52.6	11.2	11.8	1.5	25.1	21.5
	Per cap. rank	6	40	38	66	18	23
Milk	Prod. (Mt)	17166	24953.6	4544	16886	33586	36280
	Prod. rank	44	29	68	45	17	11
	Per cap (kg)	64	86	104	90	120	108
	Per cap. rank	39	26	13	23	6	9
Eggs	Prod. (000)		8654.8	632.7	6132.3		20600.1
	Prod. Rank	65	22	54	28	63	9
	Per cap (no)	0	30	14	33	0	61
	Per cap. rank	64	18	38	16	71	6
Fish	Prod. (no)	19764	9264	750	750	27043	36793
	Prod. rank	32	39	58	55	28	27
	Per cap (no)	73	32	17	4	97	109
	Per cap. rank	31	39	47	57	30	28
TOTAL meat	Prod. (Mt)	4174	4195.5	949.3	2831.0	5769.4	4804.3
	Prod. rank	31	30	68	48	17	24
	Per cap (kg)	15.5	14.5	21.7	15.0	20.7	14.3
	Per cap. rank	18	23	4	20	7	24
Buff. meat	Prod. (Mt)	2903	3036	592	1842	3899	2913
	Prod. rank	26	20	66	45	9	24
	Per cap (kg)	10.8	10.5	13.5	9.8	14.0	8.7
	Per cap. rank	13	15	5	17	4	25
Mutton	Prod. (Mt)	95	37	40	57	54	17
	Prod. rank	6	29	24	17	18	45
	Per cap (kg)	0.4	0.1	0.9	0.3	0.2	0.1
	Per cap. rank	15	31	7	21	25	47
Goat meat	Prod. (Mt)	664	455	167	443	483	522
	Prod. rank	28	47	70	50	43	37
	Per cap (kg)	2.5	1.6	3.8	2.4	1.7	1.6
	Per cap. rank	33	62	7	37	57	63
Pig meat	Prod. (Mt)	190	188	71.3	137	240.4	254
	Prod. rank	39	41	60	49	32	30
	Per cap (kg)	0.7	0.6	1.6	0.7	0.9	0.8
	Per cap. rank	29	34	11	27	23	26
Chicken	Prod. (Mt)	320	479.5	79	351	1091	1095
	Prod. rank	40	32	66	36	16	15
	Per cap (kg)	1.2	1.7	1.8	1.9	3.9	3.3
	Per cap. rank	41	26	22	21	5	7

## Annex 5. Agricultural profiles of the six districts (sources: MoAD, CBS, District and VDC Profile of Nepal 2014-2015, UNDP)

### DHADING

#### GENERAL INFORMATION

Location	Central Development Region
Ecology	Hill
Area	1962
Elevation (above mean sea level)	488-7409
Population ( 2015 projected)	335188
Number of HH (Projected 2015)	78819
Literacy	72.84
Human Development Index	0.461
Dependency ratio	0.79871

Ethnic Composition in District	
Brahman- Hill	14.98
Chhetree	14.72
Janajati	60.99
Dalit	9.11
Others	0.2

Physical access	
Market centers	Dhunibesi, Malekhu, Khanikhola, Naubishe, Dharke, Mahadebbeshi, Gajuri, Sundaribajar, Salyantar
Road Network	173.08 km

Economic Access	
Banks and cooperatives	27 Bank, 278 cooperative
Small and cottage industry	1980
Poverty rate	18.73
Food Poverty Prevalence	-

#### NUTRITIONAL STATUS

Food poverty prevalence	26.46%
Number of children under five	30080
Stunting	42.11%
Severe stunting	16.98%
Underweight	23.00%
Severe underweight	5.25%
Wasting	9.01%
Severe wasting	1.80%
Access to Improved Drinking water (Tap/piped)	84.53%
HHs having Toilets	70.37%

## AGRICULTURAL STATUS

Total cultivated land (ha): 55647

CROPS		
Paddy	Area ( ha)	12645
	Prod(Mt)	48100
	Yield (kg/ha)	3804
Maize	Area ( ha)	19353
	Prod(Mt)	48613
	Yield (kg/ha)	2500
Millet	Area ( ha)	6930
	Prod(Mt)	6953
	Yield (kg/ha)	1003
Buckwheat	Area ( ha)	-
	Prod(Mt)	-
	Yield (kg/ha)	-
Wheat	Area ( ha)	4800
	Prod(Mt)	10100
	Yield (kg/ha)	2104
Barley	Area ( ha)	350
	Prod(Mt)	350
	Yield (kg/ha)	1000
<b>Total Cereals</b>	Area ( ha)	44170
	Prod(Mt)	114116
	Yield (kg/ha)	2584
Oilseed	Area ( ha)	665
	Prod(Mt)	506
	Yield (kg/ha)	761
Sugar cane	Area ( ha)	28
	Prod(Mt)	1450
	Yield (kg/ha)	51786
Potato	Area ( ha)	1660
	Prod(Mt)	25487
	Yield (kg/ha)	15354
<b>Total Spices</b>	Area ( ha)	496
	Prod(Mt)	3439
	Yield (kg/ha)	6.94
<b>Total Pulses</b>	Area ( ha)	1364
	Prod(Mt)	1232
	Yield (kg/ha)	903
<b>Total Vegetables</b>	Area ( ha)	5925
	Prod(Mt)	75458
	Yield (kg/ha)	12735

LIVESTOCK & ANIMAL PRODUCTS	
Cattle (Number)	131976
Buffaloes (Number)	111136
Sheep (Number)	6102
Goat (Number)	147128
Pigs (Number)	21964
Fowl (Number)	922315
Duck (Number)	7773
Milking cow (Number)	18467
Milking buff. (Number)	25866
Cow milk (Mt)	10356
Buff milk (Mt)	25924
Total Milk (Mt)	36280
Buff. meat (Mt)	2913
Mutton meat (Mt)	17
Goat meat (Mt)	522
Pig meat (Mt)	254
Chicken meat (Mt)	1095
Duck meat (Mt)	3
Total meat (Mt)	4804
Laying hens (Number)	207649
Laying ducks (Number)	2678
Hen eggs (Number '000)	20426
Duck eggs (Number '000)	174
Total eggs (Number'000)	20600
Wool (Kg)	4271
Yak/Nak/Chauri (Number)	77

Irrigation infrastructures		
River/ Lake/ Pond	By gravity	7150
	Pumping	170
Dam / Reservoir		3150.3
others		990.2
mixed		4
Total		11464.5

CROP CALENDAR												
Crop	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Summer Rice				Plant	Transplant				Harv			
Spring Rice	Plant	Transpl.				Harv						
Wheat				Harv							Plant	
Summer Maize				Plant			Harv					
Spring Maize	Plant				Harv							
Winter Maize	Harv								Plant			Harv
Potato (North belt)		Plant					Harv					
Potato (South belt)		Harv							Plant			
Mustard	Harv								Plant			
Finger Millet					Plant	Transpl.			Harv			
Barley			Harv						Plant			
Soyabean						Plant			Harv			
Sugarcane	Harv		Plant									

CROP VARIETIES		
Summer	Paddy	Makwanpur-1, Khumal-4, Sabitri, Hardinath-1, Manbhog
	Maize	Rampur Composite, Manakamana-3, Arun-2
	Finger millet	Okhale-1, Kavre-1, Dalle-1 Local
Winter/Spring	Wheat	Gautam
	Maize	Rampur composite
	Barley	solu-1, Bonus, local
	Veg	Cauliflowre-white cup, remi, snow Mystique, Radish-40 Days, onion-Agrifound Dark Red, Rayo- Marpha, Brocauli- Green Sprout, F1, Bean-Forseason, Cabbage- Green Coronate, pea- Arkel, Brinjal- Chaya, Sponge Guard- Pusa Chillo, Pumpkin- Green Ball, Tomato- Gresco, Okra- Arka Anamika
	Legumes	Blackgram, Soyabean, Lentil, Horsegram, Pea, Cowpea
	Potato	Cardinal Janakdev MS-42
	Spring Paddy	CH-45,Chaite-2,Hardinath-1

## DOLAKHA

### GENERAL INFORMATION

Location	Central Development Region
Ecology	High Hill
Area (?)	1291
Elevation ( above mean sea level)	762-7183 m
Population ( 2015 projected)	180,032
Number of HH (Projected 2015)	46,738
Literacy	68.41
Human Development Index	0.459
Dependency ratio	0.8325

Ethnic Composition in District	
Brahman- Hill	9.2
Chhetree	33.41
Janajati	48.43
Dalit	8.65
Others	0.31

Physical access	
Market centers	Giri, Charikot, Kirne, Mude, Singati
Road Network	138.68

Economic Access	
Banks and cooperatives	19 Banks and 495 Cooperatives
Small and cottage industry	914
Poverty rate	25.99
Food Poverty Prevalence	34.93

### NUTRITIONAL STATUS

Food poverty prevalence	34.93%
Number of children under five	15,732
Stunting	51.47%
Severe stunting	23.58%
Underweight	31.61%
Severe underweight	8.82%
Wasting	6.83%
Severe wasting	1.24%
Access to Improved Drinking water (Tap/piped)	77.85%
HHs having Toilets	69.64%

## AGRICULTURAL STATUS

Total cultivated land (ha): 46637

CROPS		
Paddy	Area ( ha)	3175
	Prod(Mt)	5874
	Yield (kg/ha)	1850
Maize	Area ( ha)	5450
	Prod(Mt)	11718
	Yield (kg/ha)	2150
Millet	Area ( ha)	3600
	Prod(Mt)	4250
	Yield (kg/ha)	1181
Buckwheat	Area ( ha)	430
	Prod(Mt)	390
	Yield (kg/ha)	907
Wheat	Area ( ha)	4650
	Prod(Mt)	6280
	Yield (kg/ha)	1351
Barley	Area ( ha)	175
	Prod(Mt)	180
	Yield (kg/ha)	1029
Total Cereals	Area ( ha)	17480
	Prod(Mt)	28692
	Yield (kg/ha)	1641
Oilseed	Area ( ha)	317
	Prod (Mt)	254
	Yield (kg/ha)	801
Sugar cane	Area ( ha)	0
	Prod (Mt)	0
	Yield (kg/ha)	0
Potato	Area ( ha)	3000
	Prod (Mt)	36000
	Yield (kg/ha)	12000
Total Spices	Area ( ha)	168
	Prod (Mt)	765
	Yield (kg/ha)	4.55
Total Pulses	Area ( ha)	1096
	Prod(Mt)	1024
	Yield (kg/ha)	934
Total Vegetables	Area ( ha)	998
	Prod(Mt)	9906
	Yield (kg/ha)	9923

LIVESTOCK & ANIMAL PRODUCTS	
Cattle (Number)	79840
Buffaloes (Number)	52207
Sheep (Number)	15397
Goat (Number)	152760
Pigs (Number)	11374
Fowl (Number)	368630
Duck (Number)	4270
Milking cow (Number)	12128
Milking buff. (Number)	12564
Cow milk (Mt)	6686
Buff milk (Mt)	10200
Total Milk (Mt)	16886
Buff. meat (Mt)	1842
Mutton meat (Mt)	57
Goat meat (Mt)	443
Pig meat (Mt)	137
Chicken meat (Mt)	351
Duck meat (Mt)	1
Total meat (Mt)	2831
Laying hens (Number)	67839
Laying ducks (Number)	1477
Hen eggs (Number '000)	6048
Duck eggs (Number '000)	84
Total eggs (Number'000)	6132
Wool (Kg)	11086
Yak/Nak/Chauri (Number)	4083

Irrigation infrastructures		
River/ Lake/ Pond	By gravity	6607.5
	Pumping	37.4
Others		32.4
Total		6677.3

CROP CALENDAR												
Crop	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Summer Rice					Plant				Harv			
Wheat				Harv						Plant		
Summer Maize		Plant						Harv				
Mustard	Harv								Plant			
Finger Millet						Plant				Harv		

CROP VARIETIES		
Summer	Paddy	Pokharali, Kanchan, Chote Marshi, Tauli, Kumal-4, Kumal-6, Kumal-10
	Maize	Chatiya, Bamati, Pahelo, Paheli, Ganesh-1, Rampur Composit, Local
	Finger millet	Okhaley, Dalle, Kabrekodo, Kabre-1, Mudke
	Vegetable	Potato: Cardinal, MS-42, KhumalRato, Disree, Janakdev Cauliflower: White Top, Ktm.L, Snow Crown, Snow Mystic Cabbage: Green coronet, Green Stone Ghyu Simi: 4 Season Bean, Kentucky Wounder (Trisuli Simi) Tomato: Srijana, Winsari, Dalida, manisha Raddish: Mino Early, Toki Nashi, 40-Days Raio: MarphaChaudapat, KhumalChaudapat
	Wheat	Gautam, Bijaya, WK-1204, Dhaulagari, NL-297
	Tori	Pragati, Bikash, Chitwan Local
Winter/Spring	Wheat	Annpurna, Jhapali, PasangLamhu, RR-21, WK1204, Dolkha Local, Dullagiri
	Potato	Local, KafreJyoti, Janakdev, Cardinal

## GORKHA

### GENERAL INFORMATION

Location	Western Development Region
Ecology	Hill
Area (?)	3610
Elevation ( above mean sea level)	418- 8156 m
Population ( 2015 projected)	264637
Number of HH (Projected 2015)	73428
Literacy	72.11
Human Development Index	0.481
Dependency ratio	0.82195

Ethnic Composition in District	
Brahman- Hill	15.21
Chhetree	11.61
Janajati	59.7
Dalit	13.22
Others	0.26

Physical access	
Market centers	Palungtar, Gorkha Bazar, 13 kilo, Khaireni, Arughat, Siranchock, Machakhola
Road Network	177.24 Km

Economic Access	
Banks and cooperatives	22 Banks and 359 cooperatives
Small and cottage industry	1206
Poverty rate	20.41
Food Poverty Prevalence	21.62

### NUTRITIONAL STATUS

Food poverty prevalence	21.63%
Number of children under five	23195
Stunting	42.06%
Severe stunting	16.87%
Underweight	24.05%
Severe underweight	5.69%
Wasting	8.41%
Severe wasting	1.68%
Access to Improved Drinking water (Tap/piped)	65.40%
HHs having Toilets	83.14%

## AGRICULTURAL STATUS

Total cultivated land (ha): 55647

CROPS		
Paddy	Area ( ha)	12765
	Prod(Mt)	41250
	Yield (kg/ha)	3231
Maize	Area ( ha)	19353
	Prod(Mt)	45480
	Yield (kg/ha)	2350
Millet	Area ( ha)	11605
	Prod(Mt)	13928
	Yield (kg/ha)	1200
Buckwheat	Area ( ha)	393
	Prod(Mt)	396
	Yield (kg/ha)	1008
Wheat	Area ( ha)	3900
	Prod(Mt)	7334
	Yield (kg/ha)	1881
Barley	Area ( ha)	108
	Prod(Mt)	119
	Yield (kg/ha)	1102
<b>Total Cereals</b>	Area ( ha)	48124
	Prod(Mt)	108507
	Yield (kg/ha)	2255
Oilseed	Area ( ha)	625
	Prod(Mt)	770
	Yield (kg/ha)	1232
Sugar cane	Area ( ha)	60
	Prod(Mt)	889
	Yield (kg/ha)	14817
Potato	Area ( ha)	2500
	Prod(Mt)	29924
	Yield (kg/ha)	11970
<b>Total Spices</b>	Area ( ha)	303
	Prod(Mt)	1879
	Yield (kg/ha)	6.20
<b>Total Pulses</b>	Area ( ha)	5890
	Prod(Mt)	3564
	Yield (kg/ha)	605
<b>Total Vegetables</b>	Area ( ha)	1782
	Prod(Mt)	19553
	Yield (kg/ha)	10976

LIVESTOCK & ANIMAL PRODUCTS	
Cattle (Number)	101048
Buffaloes (Number)	85165
Sheep (Number)	27297
Goat (Number)	130533
Pigs (Number)	10088
Fowl (Number)	348459
Duck (Number)	1348
Milking cow (Number)	10736
Milking buff. (Number)	13697
Cow milk (Mt)	5267
Buff milk (Mt)	11899
Total Milk (Mt)	17166
Buff. meat (Mt)	2903
Mutton meat (Mt)	95
Goat meat (Mt)	664
Pig meat (Mt)	190
Chicken meat (Mt)	320
Duck meat (Mt)	2
Total meat (Mt)	4174
Laying hens (Number)	55486
Laying ducks (Number)	598
Hen eggs (Number '000)	4369
Duck eggs (Number '000)	33
Total eggs (Number'000)	4402
Wool (Kg)	19019
Yak/Nak/Chauri (Number)	2794

Irrigation infrastructures		
River/ Lake/ Pond	By gravity	5482.7
	Pumping	44.5
Dam / Reservoir		1628.8
Tube well/boring		
others		3707.8
mixed		232.2
Total		11096

CROP CALENDAR												
Crop	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Summer Rice						Plant				Harv		
Spring Rice		Plant				Harv						
Upland Rice				Plant				Harv				
Wheat					Harv						Plant	
Summer Maize						Plant			Harv			
Spring Maize		Plant				Harv						
Summer Potato				Plant		Harv						
Winter Potato		Harv									Plant	
Mustard		Harv								Plant		
Finger Millet						Plant				Harv		
Barley					Harv						Plant	
Vegetables							Plant			Harv		

CROP VARIETIES		
Summer	Paddy	Khupal-4, Sabitri, Hardinath, Ramdhan, Makawanpure
	Maize	Deuti, Manakamana-1,2, 3,6, Rampur Composite, Arun-2, Posilo Maize-1
	Finger millet	Dalle Kodo-1, Okhle Kodo, Kavre Kodo
	Vegetables	Potato: Cardinal, MS-42, Khumal Rato, Disree, Janak Dev Cauliflower: White Top, Ktm.L, Snow Crown, Snow Mystic Cabbage: Green Coronet, Green Stone Ghyu Simi: 4 Season Bean, Kentucky Wonder (Trisuli Simi) Tomato: Srijana, Winsari, Dalida Raddish: Mino Early, Toki Nashi, 40-days, Raio- Marpha Chaudapat, Kumal Chaudapat
Winter/Spring	Wheat	Gautam, Bijaya, WK-1204, Dhaulagiri, NL-297
	Vegetables	Potato: Cardinal, MS-42, Khumal Rato, Disree, Janak Dev Cauliflower: White Top, Ktm.L, Snow Crown, Snow Mystic Cabbage: Green Coronet, Green Stone Ghyu Simi: 4 Season Bean, Kentucky Wonder (Trisuli Simi) Tomato: Srijana, Winsari, Dalida Raddish: Mino Early, Toki Nashi, 40-Days Raio: Marpha Chaudapat, Khumal Chaudapat

## NUWAKOT

### GENERAL INFORMATION

Location	Central Development Region
Ecology	Hill
Area	1121
Elevation ( above mean sea level)	518-4876
Population ( 2015 projected)	273267
Number of HH (Projected 2015)	61822
Literacy	63.66
Human Development Index	0.466
Dependency ratio	0.71164

Ethnic Composition in District	
Brahman- Hill	18.94
Chhetree	12.6
Janajati	57.61
Dalit	10.7
Others	0.15

Physical access	
Market centers	Trishuli, Devighat, Battar
Road Network	140.71 Km

Economic Access	
Banks and cooperatives	15 Banks and 392 Cooperatives
Small and cottage industry	1631
Poverty rate	20.2
Food Poverty Prevalence	25.32

### NUTRITIONAL STATUS

Food poverty prevalence	25.32%
Number of children under five	21771
Stunting	39.07%
Severe stunting	14.97%
Underweight	25.85%
Severe underweight	6.33%
Wasting	9.98%
Severe wasting	2.10%
Access to Improved Drinking water (Tap/piped)	87.61%
HHs having Toilets	59.33%

## AGRICULTURAL STATUS

Total cultivated land (ha): 55647

CROPS		
Paddy	Area ( ha)	14695
	Prod(Mt)	63167
	Yield (kg/ha)	4299
Maize	Area ( ha)	19615
	Prod(Mt)	58845
	Yield (kg/ha)	3000
Millet	Area ( ha)	5120
	Prod(Mt)	9728
	Yield (kg/ha)	1900
Buckwheat	Area ( ha)	200
	Prod(Mt)	226
	Yield (kg/ha)	1130
Wheat	Area ( ha)	5470
	Prod(Mt)	17500
	Yield (kg/ha)	3199
Barley	Area ( ha)	200
	Prod(Mt)	225
	Yield (kg/ha)	1125
<b>Total Cereals</b>	Area ( ha)	45300
	Prod(Mt)	149691
	Yield (kg/ha)	3304
Oilseed	Area ( ha)	805
	Prod(Mt)	835
	Yield (kg/ha)	1037
Sugar cane	Area ( ha)	75
	Prod(Mt)	2925
	Yield (kg/ha)	39000
Potato	Area ( ha)	3600
	Prod(Mt)	65000
	Yield (kg/ha)	18056
<b>Total Spices</b>	Area ( ha)	459
	Prod(Mt)	4618
	Yield (kg/ha)	10.06
<b>Total Pulses</b>	Area ( ha)	1254
	Prod(Mt)	1250
	Yield (kg/ha)	997
<b>Total Vegetables</b>	Area ( ha)	3030
	Prod(Mt)	39248
	Yield (kg/ha)	12955

LIVESTOCK & ANIMAL PRODUCTS	
Cattle (Number)	153237
Buffaloes (Number)	119066
Sheep (Number)	18290
Goat (Number)	151846
Pigs (Number)	8845
Fowl (Number)	1221055
Duck (Number)	2672
Milking cow (Number)	21143
Milking buff. (Number)	23204
Cow milk (Mt)	11188
Buff milk (Mt)	22398
Total Milk (Mt)	33586
Buff. meat (Mt)	3899
Mutton meat (Mt)	54
Goat meat (Mt)	483
Pig meat (Mt)	240.38295
Chicken meat (Mt)	1091
Duck meat (Mt)	2
Total meat (Mt)	5769.383
Laying hens (Number)	199540
Laying ducks (Number)	1351
Hen eggs (Number '000)	19555
Duck eggs (Number '000)	89
Total eggs (Number'000)	19644
Wool (Kg)	12803
Yak/Nak/Chauri (Number)	953

Irrigation infrastructures		
River/ Lake/ Pond	By gravity	11148.2
	Pumping	27.8
Dam / Reservoir		1999.8
others		518.6
mixed		33.5
Total		13727.9

**CROP CALENDAR**

Not available

**CROP VARIETIES**

Summer	Paddy	Khupal-4, Sabitri, Hardinath, Ramdhan, Makawanpure
	Maize	Deuti, Manakamana-1,2, 3,6, Rampur Composite, Arun-2, Posilo Maize-1
	Finger millet	Dalle Kodo-1, Okhle Kodo, Kavre Kodo
	Vegetable	Potato -: Cardinal, MS-42, Khupal Rato, Disree, Janak Dev Cauliflower -: White Top, Ktm.L, Snow Crown, Snow Mystic Cabbage -: Green Coronet, Green Stone Ghyu Simi -: 4 Season Bean, Kentucky Wonder (Trisuli Simi) Tomato -: Srijana, Winsari, Dalida Raddish -: Mino Early, Toki Nashi, 40-days, Raio- Marpha Chaudapat, Kumal Chaudapat
Winter/Spring	Wheat	WK-1204, Gautam, NL 297
	Maize	Rampur Composit, Arun-2, Deuti
	Barley	Okhale, Dalle, Local
	Legumes	Black gram, Local Bean, 4 Season, Cowpea, Arakash, Parakash, Lentil, Khajura-1, Simal, Sital, Shikhar
	Potato	Cardinal Disire, Kufre jyoti, Janakdev

## RASUWA

### GENERAL INFORMATION

Location	Central Development Region
Ecology	High Hill
Area (?)	1544
Elevation ( above mean sea level)	614 m-7227 m
Population ( 2015 projected)	42773
Number of HH (Projected 2015)	10248
Literacy	64.34
Human Development Index	0.461
Dependency ratio	0.78217

Ethnic Composition in District	
Brahman- Hill	15.07
Chhetree	2.5
Janajati	78.33
Dalit	2.95
Others	1.15

Physical access	
Market centers	Saprebasi, Dunchhe, Kalika, Betrawati
Road Network	66.20 Km

Economic Access	
Banks and cooperatives	5 Banks and 126 Cooperatives
Small and cottage industry	398
Poverty rate	31.63
Food Poverty Prevalence	40.82

### NUTRITIONAL STATUS

Food poverty prevalence	40.82%
Number of children under five	3742
Stunting	47.15%
Severe stunting	20.34%
Underweight	31.54%
Severe underweight	8.91%
Wasting	9.34%
Severe wasting	1.94%
Access to Improved Drinking water (Tap/piped)	87.87%
HHs having Toilets	56.69%

## AGRICULTURAL STATUS

Total cultivated land (ha): 8940

CROPS		
Paddy	Area ( ha)	1305
	Prod(Mt)	3240
	Yield (kg/ha)	2483
Maize	Area ( ha)	2430
	Prod(Mt)	5080
	Yield (kg/ha)	2091
Millet	Area ( ha)	900
	Prod(Mt)	833
	Yield (kg/ha)	926
Buckwheat	Area ( ha)	0
	Prod(Mt)	0
	Yield (kg/ha)	0
Wheat	Area ( ha)	740
	Prod(Mt)	1856
	Yield (kg/ha)	2508
Barley	Area ( ha)	173
	Prod(Mt)	190
	Yield (kg/ha)	1098
<b>Total Cereals</b>	Area ( ha)	5548
	Prod(Mt)	11199
	Yield (kg/ha)	2019
Oilseed	Area ( ha)	694
	Prod(Mt)	439
	Yield (kg/ha)	632
Sugar cane	Area ( ha)	0
	Prod(Mt)	0
	Yield (kg/ha)	0
Potato	Area ( ha)	2560
	Prod(Mt)	37200
	Yield (kg/ha)	14531
<b>Total Spices</b>	Area ( ha)	63
	Prod(Mt)	475
	Yield (kg/ha)	7.53
<b>Total Pulses</b>	Area ( ha)	410
	Prod(Mt)	352
	Yield (kg/ha)	859
<b>Total Vegetables</b>	Area ( ha)	492
	Prod(Mt)	4764
	Yield (kg/ha)	9692

LIVESTOCK& ANIMAL PRODUCTS	
Cattle (Number)	24571
Buffaloes (Number)	16839
Sheep (Number)	10886
Goat (Number)	37530
Pigs (Number)	5252
Fowl (Number)	84876
Duck (Number)	598
Milking cow (Number)	3899
Milking buff. (Number)	4041
Cow milk (Mt)	1854
Buff milk (Mt)	2690
Total Milk (Mt)	4544
Buff. meat (Mt)	592
Mutton meat (Mt)	40
Goat meat (Mt)	167
Pig meat (Mt)	71.27
Chicken meat (Mt)	79
Duck meat (Mt)	0
Total meat (Mt)	949.27
Laying hens (Number)	8968
Laying ducks (Number)	91
Hen eggs (Number '000)	628
Duck eggs (Number '000)	5
Total eggs (Number'000)	633
Wool (Kg)	7838
Yak/Nak/Chauri (Number)	3256

Irrigation infrastructures		
River/ Lake/ Pond	By gravity	327.2
Dam / Reservoir		105.5
others		303.1
mixed		72.3
Total		808.1

CROP CALENDAR												
Crop	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Summer Rice					Plant					Harv		
Spring Rice		Plant				Harv						
Upland Rice				Plant				Harv				
Wheat				Harv						Plant		
Summer Maize						Plant			Harv			
Spring Maize		Plant				Harv						
Summer Potato				Plant			Harv					
Winter Potato		Harv							Plant			
Mustard		Harv								Plant		
Finger Millet						Plant				Harv		
Barley				Harv						Plant		
Winter Vegetables	Harv							Plant			Harv	
Summer Vegetables				Plant			Harv					
Legumes						Plant				Harv		

CROP VARIETIES		
Summer	Paddy	Khumal 10, Kumal 4, Chinung-242, Sabitri, Hybrid (PSC), Radha-4, Sabitri, Radha-11, Makwanpur-1, Kumal-11, Kumal-8, Sukha, Ramdhan (Chaite Dhan/Early rice- Kanchan, Hardinath-1)
	Maize	Rampur composite, Hybrid, Local, Arun-2, Deuti, Shitala
	Finger millet	Local
Winter/Spring	Wheat	WK 1204, RR 21, Dhaulagiri, Gautam
	Barley	Local
	Vegetables	Cauliflower (Kathmandu Local, Silver cup, Snow mystique) Cabbage (Green Cornet), Radish (All season, Mino early, 40 days), Carrot (New Kuroda), Turnip (Hybrid), Tomato (Sirjana, Manisha, Amrita)
	Legumes	Local, Arkel, Aajad, Sikimme
	Potato	MS 42, Cardinal

## SINDHUPALCHOCK

### GENERAL INFORMATION

Location	Central Development Region
Ecology	High Hill
Area	2542
Elevation ( above mean sea level)	850 m-7080 m
Population ( 2015 projected)	280960
Number of HH (Projected 2015)	69359
Literacy	69.75
Human Development Index	0.455
Dependency ratio	0.75482

Ethnic Composition in District	
Brahman- Hill	10.3
Chhetree	18.23
Janajati	65.15
Dalit	6.11
Others	0.21

Physical access	
Market centers	Chautara, barabishe, Tatopani, Liping, Khadichour
Road Network	196.25Km

Economic Access	
Banks and cooperatives	28 Banks and 569 Cooperatives
Small and cottage industry	1420
Poverty rate	25.42
Food Poverty Prevalence	36.94

### NUTRITIONAL STATUS

Food poverty prevalence	36.94%
Number of children under five	23494
Stunting	48.36%
Severe stunting	21.22%
Underweight	30.89%
Severe underweight	8.54%
Wasting	8.57%
Severe wasting	1.72%
Access to Improved Drinking water (Tap/piped)	80.74%
HHs having Toilets	64.13

## AGRICULTURAL STATUS

Total cultivated land (ha): 59151

CROPS		
Paddy	Area ( ha)	12235
	Prod(Mt)	28446
	Yield (kg/ha)	2325
Maize	Area ( ha)	24907
	Prod(Mt)	53958
	Yield (kg/ha)	2166
Millet	Area ( ha)	19320
	Prod(Mt)	21252
	Yield (kg/ha)	1100
Buckwheat	Area ( ha)	0
	Prod(Mt)	0
	Yield (kg/ha)	0
Wheat	Area ( ha)	7010
	Prod(Mt)	7862
	Yield (kg/ha)	1122
Barley	Area ( ha)	200
	Prod(Mt)	200
	Yield (kg/ha)	1000
<b>Total Cereals</b>	Area ( ha)	63672
	Prod(Mt)	111718
	Yield (kg/ha)	1755
Oilseed	Area ( ha)	2500
	Prod(Mt)	850
	Yield (kg/ha)	340
Sugar cane	Area ( ha)	0
	Prod(Mt)	0
	Yield (kg/ha)	0
Potato	Area ( ha)	5040
	Prod(Mt)	60480
	Yield (kg/ha)	12000
<b>Total Spices</b>	Area ( ha)	1072
	Prod(Mt)	9136
	Yield (kg/ha)	8.52
<b>Total Pulses</b>	Area ( ha)	3450
	Prod(Mt)	3451
	Yield (kg/ha)	1000
<b>Total Vegetables</b>	Area ( ha)	3812
	Prod(Mt)	36110
	Yield (kg/ha)	9473

LIVESTOCK & ANIMAL PRODUCTS	
Cattle (Number)	78552
Buffaloes (Number)	81790
Sheep (Number)	10905
Goat (Number)	164642
Pigs (Number)	14315
Fowl (Number)	542137
Duck (Number)	1289
Milking cow (Number)	14766
Milking buff. (Number)	19612
Cow milk (Mt)	7120
Buff milk (Mt)	17834
Total Milk (Mt)	24954
Buff. meat (Mt)	3036
Mutton meat (Mt)	37
Goat meat (Mt)	455
Pig meat (Mt)	188
Chicken meat (Mt)	479.50
Duck meat (Mt)	0
Total meat (Mt)	4195.51
Laying hens (Number)	99943
Laying ducks (Number)	294
Hen eggs (Number '000)	8640
Duck eggs (Number '000)	15
Total eggs (Number'000)	8655
Wool (Kg)	8241
Yak/Nak/Chauri (Number)	1191

Irrigation infrastructures		
River/ Lake/ Pond	By gravity	11783.80
	Pumping	56.5
Dam / Reservoir		123.5
others		467.1
mixed		4.6
Total		12435.5

CROP CALENDAR												
Crop	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Summer Rice				Plant					Harv			
Spring Rice	Plant					harve						
Wheat				Harv							Plant	
Summer Maize				Plant			Harv					
Spring Maize		Plant				Harv						
Summer Potato	Plant					Harv						
Winter Potato		Harv							Plant			
Mustard	Harv								Plant			
Finger Millet				Plant					Harv			
Barley			Harv						Plant			
Vegetables							Plant			Harv		
Legumes							Plant					

CROP VARIETIES		
Summer	Paddy	Khumal -4, Khumal-8, Makwanpur-1, Pokharali masino, Himali, Kanchan
	Maize	Rampur, Composit, Manokamana-1, Deuti-1, Deuti-3
	Finger millet	Dale, Okhale, Kavre-1, Local
	Vegetables	Cucumber: Bhaktapur local, Silverstar, Beli, local Squash: Blum house Beans: Kutukiwonder, four seasons Pumpkin: local
Winter/Spring	Wheat	Anapurna-3, Annapurna-4, Pasanglahamung BL-1471, WK-1204, Gautam
	Maize	Arun-1, Arun-2, Arun-4
	Barley	Local
	Vegetables	Cauliflower: Snow Mystic, Snow Crown, Silver Cup-60, Kathmandu local Cabbage: Green Coronet, Green Stone Radish: Minoearly, Tokinasi, Peuthane red Carrot: Newkoroda, Nanties Pea: Arkel'sikim Spinach: Patne selection Rayo: Marphachaurapat, Khumalcharapat

## Annex. 6 List of FAO enumerators in the six districts

Gorkha	Ganesh Raj Panta	DTO Livestock
	Bijaya Raj Devkota	DTO Agriculture
	Santosh Khadka	DTO Nutrition
Dhading	Rajendra Basnet	DTO Livestock
	Daya Ram Sapkota	DTO Agriculture
	Anu Bista	DTO Nutrition
Nuwakot	Rambali Shaha	DTO Livestock
	Parmeshwar Kalwar	DTO Agriculture
	Munna Tumbrok Limbu	DTO Nutrition
Rashuwa	Sushila Shrestha	DTO Livestock
	Maniram Sigdel	DTO Agriculture
	Durga Khadka	DTO Nutrition
Sindhupalchowk	Jagat Narayan Yadav	DTO Livestock
	Gangaram Yadav	DTO Agriculture
	Keshab Raj Sapkota	DTO Nutrition
Dolakha	Yanamani Nepal	DTO Livestock
	Dilip Jung Rana	DTO Agriculture
	Abhishek Pandey	DTO Nutrition

**For any question regarding this report, please contact:**

Neil Marsland, Senior Technical Officer [neil.marsland@fao.org](mailto:neil.marsland@fao.org)

Oriane Turot, Food security analyst [oriane.turot@fao.org](mailto:oriane.turot@fao.org)

