Study report on

Food Security in Karnali

Scoping the food system, agriculture and local livelihoods

Based on case studies in 4 VDCs of

Bajura and Mugu

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Contents

Acronym

AAN	Action Aid Nepal
ADB	Asian Development Bank
AIC	Agriculture Inputs Corporation
APP	Agricultural Perspective Plan
BMI	Body Mass Index
CBS	Central Bureau of Statistics
CE	Conservation Economy
CEAD-Nepal	Center for Equal Access Development-Nepal
CF	Community Forest
CFSVA	Compressive Food Security and Vulnerability Analysis
CFUG	Community Forestry Users Group
CNP	Chitwan National Park
CSRC	Community Self Reliance Center
COV	Coefficient of Variation
DADO	District Agriculture Development Office
DAP	District Agriculture Plan
DDC	District Development Committee
DFID	Department for International Development
DoF	Department of Forest
DSS	Dhanusha Sewa Samiti
EU	European Union
FAO	Food and Agriculture Organization
GDP	Gross Domestic Product
GMO	Genetically Modified Organism
GoN	Government of Nepal
Ha	Hectare
HHs	Households
HMG	His Majesty's Government
IFPRI	International Food Policy Research Institute
IMF	International Monitory Fund
INGO	International Non Governmental Organizations
IPs	Indigenous Peoples

MNC	Multi National Cooperation
MoA	Ministry of Agriculture
MoF	Ministry of Forest
MoHP	Ministry of Health and Population
MT	Metric Ton
NARC	Nepal Agriculture Research Council
NAF	Nepal Agro-forestry Foundation
NFC	Nepal Food Cooperation
NGO	Non Governmental Organizations
NIDS	Nepal Institute of Development Studies
NPC	National Planning Commission
NRs	Nepalese Rupees
NSFS	National Strategic Food Reserve
NTFPs	Non-Timber Forest Products
NYSC	New Young Star Club
PAF	Poverty Alleviation Fund
PM	Prime Minister
PO	Program Officer
SA	Sustainable Agriculture
SAPL	Second Agricultural Program Loan
TNC	The Nature Conservation
UCPA	Underlying Causes of Poverty Analysis
UCPN	United Communist Party Nepal
UNDP	United Nations Development Programme
UNIFEM	United Nations Development Fund for Women
US Aid	United States Agency for International Development
VDC	Village Development Committee
WB	World Bank

Executive summery

This report describes the objectives, methodology and results of the study entitled; Food Security in Karnali: Scoping the food system, agriculture and local livelihoods. The study, which was managed by ForestAction Nepal in collaboration with the Care Nepal, rights to food network and local partners working in the study area and was funded by Care Nepal. The study proposal for assessment on local food system, livelihoods and its political economy focusing on Karnali region was based on the experiences of previous AAN supported study in 7 districts across the country on the same topic, with focus on status and scope of agriculture.

This report presents findings relating to the objectives of the study. Firstly, it provides a context and background information, which leads onto an explanation of the project's objectives and expected outcomes and study methodology developed for the project. Second, a literature review has been discussed focusing on the food issues. Third, discussions on the findings are discussed referring the cases annexed with the report. Fourth, it describes key issues and agenda of food and agriculture in Karnali region and finally, it provides the main conclusions from the research undertaken as well as recommendations for further research and policy in actions.

The finding of the study suggests the food insecurity in the region is increasing as well as agriculture production and productivity is declining rapidly. The key factors of the situation are; changing food and agriculture practice, migration, climate change effects. These have caused serious problem to the lives and livelihoods of poor and marginalized, women and other vulnerable communities. Similarly, there is high level of dependencies, lack of inputs and services and feminization of agricultural works in great extent. All these suggest that there are both structural as well as operational problems which demands high level of commitment and strategic plans to improve the situation.

Since this was brief context mapping exercise carried out in 4 VDCs of two districts of the Karnali region, therefore have limited scope of generalisation across the region as well as the object of study. We recommend a detailed study in the areas identified above is crucial to deepen the understanding of the issues in detail.

1 Background of the study

CARE-Nepal, in partnership with government organizations and local communities, is carrying out various activities of sustainable agriculture and food security. It is actively engaged in capacity building of the community groups, local partner organizations and network members to raise the voices of poor, vulnerable and socially excluded, deprived people through dialogues, debates and policy influence at various levels. CARE-Nepal- a member of the National Network on Right to Food Nepal (RtFN) –is engaged in promoting the Right to Food in Nepal, proposes to enrich the initiative by brining insights and evidences from field to influence the national policy processes including ongoing constitution building and interim 3 year plan.

In this background, CARE Nepal aiming to generate evidence based knowledge on practical problems on food security in the Karnali region, propose to carry out the context mapping exercise on resource assessment, production and marketing in 4 VDCs of the 2 districts of mid-western region: Mugu and Bajura - the most food deficit districts of the region as well as working area of CARE, Nepal. This study was carried out by a group of researchers at Forest Action, Nepal, who have carried out similar research activities in other parts of the country.

2 The objective of the study

The objective of study was to assess the status and relationship between agriculture **resource, production and marketing** that has affected on food rights, food sovereignty and food security of the vulnerable communities. It focuses on local food system, livelihoods and its political economy at village level aiming to understand the practical problems of current agriculture and explore the potentials of sustainable agriculture solving these. We hope, the understanding developed through this research will enable CARE-Nepal partners and other stakeholders to identify and implement locally suitable food security activities following the principles of sustainable agriculture as well as helps to bring the policy issues in debate. Specifically it aimed at;

- To assess the government policy for assisting food production for the vulnerable communities; food distribution pattern.
- To assess the government policy on food sovereignty, food security and food rights.

- To know existing farming system across the ecological regions and trend of food production over the years (5 -7 years)
- To assess the food security situation and coping strategies by the vulnerable communities; and the policy implementation status at the field level.
- To assess the potentiality of food production, management of factor of production, food distribution and marketing systems.
- To assess the farmers group/ cooperative approach in the community to cope the food security.
- To assess the out migration factors and its link with food security and livelihood issues.

3 Methodology of study

This study followed the participatory research methodology. Interactive process and case studies methods were used to generate information and HHs data. A tentative framework on data generation and analysis was developed by researchers in collaboration with the supporting partners, reviewing literatures and stakeholders consultation. The study was carried out using case study approach to qualitative research.

Photo 1: Interaction with local people

This study combines two levels of inquiry and analysis; a) Literature review on food security in Nepal was carried out before the field visit while, national context was reviewed capturing mainly the agriculture status and scope in an earlier study with Action Aid. In this study, we focused on food security issues devising the specific sets of questions, propositions and a framework to guide the observation for the subsequent field work.

b) Empirical case studies in 4 VDCs of two districts of greater Karnali where local context mapping of the food security was carried out and examined, using various participatory tools and techniques. Review of literatures as well as observation used to generate data of both qualitative as well as quantitative nature. Analysis of the food security impact at HHs level (men and women) was done using the conceptual framework of Sustainable livelihoods (SLA) using the tools and techniques of UCPA and other participatory mapping.

Within the proposed framework of study, guide questionnaires (Annex 2) were developed and discussed with the study team and local partners. In the village, through interviews, focus group discussion, document analysis and participatory social and resource mapping, with various groups of people of both male and female, detail information on food system, livelihoods and local economy were generated using various participatory tools of poverty assessment including Underlying Causes of Poverty Analysis (UCPA). Emphases have been given to generate desegregated data on class, caste gender and ethnicity, as far as possible.

3.1 Steps followed in study

The steps followed in the study were as follows a) a brief discussion with partners at their office on the objective of the study, selection of case study site and plan for village level activities, b) w/s with different categories of farmers in the village including other stakeholders c) visit and focus group discussions/interviews with male and female farmers and field observations d) sharing meeting with partners and other stakeholders.

3.1.1 Meeting with partner organizations

In each case study sites, an introductory meeting was held to discuss the objective, process of case studies and plan for field visit. In each districts, researchers explained the background and objective of the study followed by the importance of field studies, role of partner organization and the expectation from the field studies

The focused discussions with the partners helped us to understand the local issues, agendas related with food security sustainable agriculture and people's livelihoods as well as highlighted various problems, issues and challenges faced by farming populations, agriculture services as well as policy gaps. The tentative plans for focus group discussions, HHs interviews and interactive meetings with villagers were prepared during these meetings.

3.1.2 Interactive meeting with farmers in the villages

The next step of the case study was to discussion with farmers of various categories, local representatives of the service providers and local leaders. These meetings were held in the villages where partners are already working and/or willing to promote food security and

agriculture activities in future. In these meetings, with brief introduction to the objectives of the meeting discussions on farmer's experiences on ongoing food security situation, local livelihoods and as well as agriculture were carried out. These discussions were focused mainly on;

- Existing food security situation, farming practice and how it differs in different location within VDCs.
- Farmers response on their experiences with the present farming practices, especially the practice of using high inputs.
- Different types of innovations done by farmers and their experiences on these innovations
- Preparation of a social map- A detailed resource map of the VDC (farms, agro-forest farms, organic farms, chemical farms, forest, CF, irrigation, cropping pattern, pastures, water sources, waste lands, uncultivated food sources - locations).
- Potential areas where food can be produced using different methods like farming, agro-forestry, and horticulture.
- Existence of public land, community forests, and their use.
- Location of poor and resource poor farmers.
- Case studies (food crisis, coping strategies as well as innovative farming practices).

3.1.3 Household visit and survey

Following the workshop with representatives, farmer's field visit was planned and carried out. The following were the major activities of the field visit. The aim of the field visit was to observe field situation, interview with farmers at HHs level and discuss in small group on the various aspects of the food and agriculture. The visit was done with the field staffs so that all team members could internalize and reflect on the overall situation of farming practice. The following activities carried out in all case study sites, as far as possible;

- Transact walk with partners, farmers etc (multi-disciplinary team)
- Visiting the farms (using different alternative CE as well as a few chemical farms)
- Case studies on livelihood situation, food system and security situation
- Visiting offices of local institutions (co-operative, CF, saving-credit groups, veterinary office, etc)

- Interviews with different categories of farmers (big farmers, small farmers, Dalits, Women, IPs etc – main concern is about present farm practices, food security, livelihood, how food can be produced more, present problems in food quality, feasibility of alternatives etc).

3.1.4 Debriefing with partners

Finally, in each case study sites, a debriefing meeting was organized with partners to share general impressions on the field situation, observations and findings of the case study. The researchers also shared the preliminary analysis of the observation and findings of the case studies during these meeting.

3.1.5 Consultation with district level stakeholders

In each district, consultation workshops were organized to discuss the issues under investigation as well as to share the preliminary findings of the study. The reflections in these meetings were very useful to understand the perspectives, ideas and activities of the district level stakeholders around these issues. At the same time, these meeting also helped research team to get broader picture of the policies and plans of food and agriculture development.

3.2 Target group, Study sites, Timeframe and team of the field study

Target group and study sites

The field study was carried out in the area where local partners are conducting their mobilisation activities. The HHs survey and local level interactions/interviews were conducted with poor and marginalized groups in the selected villages of the respective VDCs. The study was carried in Mugu and Bajura Districts.

Mugu district is located in the Mid-Western Development Region of Nepal, surrounded to the west by Humla and Bajura districts, to the south by Jumla and Kalikot districts, to the east by Dolpa district and to the north by Tibet. The estimation of the total population in the whole district is 55415 inhabitants. The majority of the population comprises Hindus (89.7%) and then after Buddhist (9.9%). Chhetris (48.7%), Dalits (19.8%), Thakuri (16.8%) and Janajati (9.2%) are the prevalent caste and ethnic groups of the district. It is the least developed district of the nation with no road linkage and electricity facility. The district is politically

divided in to 24 VDCs. Gamgadi is the district headquarter of the district. Due to the increasing trend of population and adverse climatic effect, the district suffered the food insecurity problems since 10- 15 years. The present study covers the two remote VDCs out of 24 VDCs of the Mugu district. Jima and Dhainakot are selected for the study as these two VDCs are the most food insecure VDCs of the district.

Jima VDC is one of the remote and food insecure VDC of the Mugu district. It is surrounded by the Rara and Kalai at the south, Fortu at the north, Ruga at the east and Natharpu at the west. The totals of 438 farming HHs are situated at the VDC with the total population 2761 and average family size 6.3. The majority of the population consists of Brahmin/Chettry. Dalits are in minority.

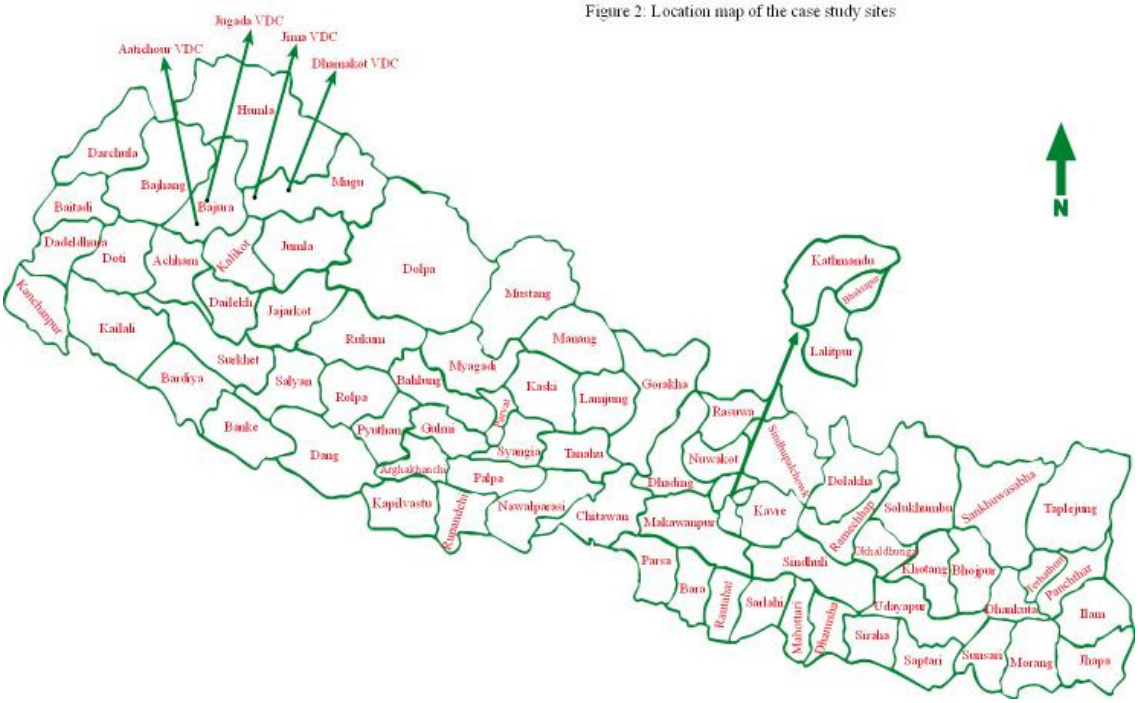
Dhainakot VDC is situated at the Viye and Humla at the north, Riatu, Kotgada and Shreekot VDC at the south, Kalai at the east and Bajura district at the north side. The total 405 HHs are inhabitant with the total population of 2405 and average family size is about 5.9. Mugu Karnali and Humla Karnali meet here and flow across the side of this VDC.

Bajura district is mountainous district situated in Far Western Developmental Region of Nepal. This district is surrounded by Mugu, Humla, Kalikot, Bajhang and Achham. It occupies an area of 2,188 sq. km. Bajura extends from 28 18' northern latitude to 29 5' northern latitude and from 80 90' eastern longitude to 81 5'E longitude. It extends from 727 m to 7036 m altitude from sea level. It is the least developed district of the far western Nepal with no road linkage, electricity and telephone facilities. It is politically divided into 27 Village Development Committees. Martadi is the district headquarters of Bajura district. According to census 2001, its population is 1, 08,781 having 20,378 households and population density of the Bajura is 50/ sq. km. Bajura occupies about 0.47% of total population of Nepal.

Jugada VDC is situated 2 kilometer west from the DHQ, Martadi of the Bajura district. It is surrounded by Martadi from east, Aatichour from west, Manakot and Dahakot from north and Budiganga VDC from south. Total population is 5579 from the 868 households of the VDC. Majority of the population are Brahmin and Chettry which is 47.52 percentage of total population and least Janajati having only one household.

Aatichour VDC is situated 8 kilometer west from the DHQ, Martadi of the Bajura. It is surrounded by Manakot, Dogadi, Gudukhati, Bramatola and Jugada VDCs of the Bajura district. Total households of the VDC are 633 out of which 112 households are fall under Dalits and rests are Brahmin/Chettry. The aggregate population of the Aatichour VDC is 3642 in which 1900 are female and 1734 are male. Brahmin/Chettry are the dominant caste and Janajatis are absent in this VDC.

Figure 2: Location map of the case study sites



Study team and time frame

The study was conducted by a professional team of researcher based at Forest Action, Nepal in partnership with local partners of CARE Nepal- Peacewin in Bajura, and SAHAS and CEAD in Mugu. A team visited the field site in Bajura from 28 August to September 11, 2010 and Mugu from 9 November to 22 November, 2010. List of the participants involved in the study is attached in Annex 4.

4 Food security problem in Nepal

Food security has been a global issue now. The recent increase (2005-2008) in price of food internationally and the diversion of resources to produce other-than-food has increased the concern on food security. At the global level, there is more concern on financial crisis rather than the millions of people going hungry, because the later problem takes place in developing

countries. If it were a problem of a developed country, this issue would have drawn the world attention. The present food crisis is stalking the small-scale farms and rural areas of the world, where 70 percent of the world's hungry lives and work. The situation in rural areas in developing countries is dire, coming in the wake of the surge in food and fuel prices in 2007–2008. This second crisis is hitting the poor while they are down. Money sent home from relatives working in the city or abroad has declined as unemployment bites. In small agricultural villages, the poor have already exhausted their savings to buy food. Even though prices have come down as compared to 2008, the prices of cereals are still more than 63 % of what were in 2005. Some of the reasons for higher food prices include: low agricultural productivity in the world; high population growth rate in many of the most food insecure countries; problems with water availability and land tenure uncertainty; more frequent floods and drought; low investment in agriculture, which remained about 4 % of the total investment in most developing countries. Another phenomenon associated with rising food prices and decline in food production is the global hunt for land in developing countries[1]. In future, this is going to be a major issue in food security worldwide, including Nepal, where the land enclosure and grabbing is increasing trends. This calls for a question on 'whose food security?'

Even though the Millennium Development (MDG) on poverty is to halve the proportion of hungry population by 2015, the number of food insecure population is increasing. With an estimated increase of 105 million hungry people in 2009, there are now 1.02 billion malnourished people in the world, meaning that almost one sixth of all humanity is suffering from hunger (http://www.fao.org/getinvolved/worldfoodday/en/). The target of reducing the number of undernourished people by half to no more than 420 million by 2015 will not be reached if the trends that prevailed before those crises continue. But at the world level, there is food surplus. For example, in 2008/09, there was 510.4 million mt cereal stock, which increased to 528.1 million mt. Of the total cereal produced in the world, slightly less than half is consumed and the rest is used for feed and other purposes[2]. Therefore, talking at the world

[1] This is popularly called as 'land grab', and countries like Gulf States, Japan, China and other have been buying the land for farming in developing countries. The estimates of this land grab differ a lot, but FAO estimated that this could be about 74 million ha. In most cases of 'land grab', the productivity has increased almost by four fold, but the local population is deprived of their livelihood opportunities.

[2] For example, in 2009/2010, 2253.1 million mt cereal was produced, of which 1040 million mt was consumed as food, 768 million mt was used as animal feed and 415.4 million mt was used for other purpose (FAO food situation estimate –www.fao.org)

level, there is food surplus. But this surplus is taking place in developed countries and less developed countries like are increasingly becoming depend on developed countries for food.

4.1 Understanding food security[3]:

Understanding of food security concepts is important in order to analyze the situation and come up with strategies for improvement. There is no common framework for understanding food security or insecurity. There is even more disagreement with regard to what action and approach to take to mitigate food insecurity problems. It seems that different organizations' or institutions' approaches to food insecurity depend on various local, national and international factors including philosophy regarding the role of market or trade, political and human rights, ecological sustainability, and national sovereignty with regard to food and food production and larger political-economic interest. In the 1960s and 1970s, food security was understood more generally as the ability of a nation to meet the aggregate food needs in a constant manner. Accordingly, countries used to develop food balance sheets showing the aggregate supply and demand or requirement based on food requirements norms (like 180 kg food per capita per year in the past, and 200 kg now – this is particularly so in Nepal). The World Food Conference in 1974 identified sufficient food production, reliable supply and less fluctuating prices as crucial for meeting food security. Accordingly, technologies introduced with the green revolution, that contributed to increase in production were emphasized to improve food security in developing countries. It was believed that the market will regulate supply and price, once the food production has increased significantly. In the 1980s, with the seminal work of A.K. Sen that emphasized entitlements or access to food, the approach to food security shifted towards the 'demand side', i.e., providing access of individuals to food through the market or social/political mechanisms. Lately, some concerns have also been raised by economists with neo-liberal principles over giving reemphasis on the supply side (i.e., production of food and productivity of resources). They have emphasized on the technology part also. As a result, technologies like GMOs (genetically modified organisms) or other forms of bio-technology have been promoted and multinational companies are encouraged for increasing the food supply. On the other hand, social activists in developing countries have shown concerns on, food safety, and subjective feeling on food

[3] This conceptual analysis has drawn extensively from the author's article "Conflict and Livelihood Security: A Case of Nepal". In: Livelihood Issues in Contemporary Times. Ulrike Bokers (ed). Zurich: University of Zurich (NCCR).

regarding rights to adequate food, rights to feed oneself, food sovereignty (to have control on food chain by developing countries themselves so that they have independent decisions on how best to meet their food security) and cultural suitability. Increased integration of different nations' economies associated with processes of globalization, as well as new international trade institutions, agreements and policies such as the World Trade Organization (WTO) have given rise to these new concerns. These concerns have also been vital in shaping the food security policies in developing countries, including Nepal. After the political revolution of April 2006 in Nepal, civil society activists emphasized the rights to food and food sovereignty. These provisions were also placed in the 'interim constitution' of 2007. Following this constitution, Nepal's three year interim plan (2008-2010) has for the first time kept a chapter on 'food security'.

Despite changes in the basic approach in food security and hundreds of definitions made so far, two definitions are given here which are often influential in devising policies in developing countries.

> 'Access by all people at all times to enough food for an active, healthy life (World Bank, 1986).
>
> 'Food security means that food is available at all times; that all persons have means of access to it; that it is nutritionally adequate in terms of quantity, quality and variety; and that it is acceptable within the given culture. Only when all these conditions are in place can a population be considered "food secure'. *(http//www.fao.org).*

Of these two definitions, FAO's definition seems more comprehensive. It focuses on four key components: availability, access, utilization and stability. FAO considers these as the four pillars of 'food security'. These concepts of food security examine food security at the household level as a measure of welfare and attempts have been made to make the concept operationally useful in the design, implementation, and evaluation of programs, projects and policies. A distinction is frequently made between transitory and permanent food insecurity, where the former describes periodic food insecurity as for example seasonal food insecurity, while the latter describes a long-term lack of access to sufficient food. Intra-household allocation of the food is also examined nowadays because of discriminations in the allocation

of food within the household. These discriminations could take place along the age and gender lines.

- **Availability** refers to the possibility either for feeding oneself (individual, household or other units under consideration) directly from productive land or other natural resources, or through distribution, processing and marketing systems that can move food from the site of production to where it is needed. At the international level, there is sufficient food available to feed about 6 billion people (Lappe, et al, 1999). All nations can achieve and maintain sufficient food supply for its population through domestic production, imports and a combination of both (ibid). Hence, for effective availability, proper policies are needed regarding production, distribution, processing and marketing of food. In Nepal, lack of infrastructure, marketing information and support, especially in the hills, often pose constraints for effective availability of food. The recent armed conflict has also led to increased in food-deficits, especially in hill and mountain districts.

- **Access** refers to economic, physical and social access to food or purchasing and/or food-gaining capacities of the people (which include food prices in relation to wage rates, income opportunities, and social networks providing food during distress, traditional safety nets etc.). Each household/ individual should have access to food. Sen (1991) used the idea of entitlement and endowments to explain how a person can have access to food. According to Sen, food availability in the market does not guarantee people's access to consume this food. Therefore individuals and households can have legitimate command over foods and other commodities if they have entitlements to 'bundle of resources' such as land, capital, technology, skills, stocks and income. Sen later used the term 'expanded entitlement' to include social networks, kin relations and the like that help in receiving food especially during the stressful times.

- **Utilization**: It refers to proper use of food, good food habits and availability of culturally acceptable food. It also means conversion of food intake into nutrition and physical functions, which also depends upon other ‘complementary factors’ like safe drinking water, health protection and the like. Given that food is important when it can be converted into bodily or metabolic use, its conversion into nutrition (utilization) is also essential. Therefore it is important that each individual should have food utilization capacity. Nutritional status (nutritional security) is taken as an indicator of food security

considering the utilization part also. Another critical dimension of the utilization aspect of food security is the food safety.

- **Stability**: Food security also means sustainable food system (production, distribution, consumption, and waste management) at all levels– from household to national and international levels and at all times. Therefore, stability means food system should be able to meet the basic food needs without much fluctuations, especially the probability of availability and access to food going below the required level should be made minimum.

There are also other dimensions to food security, which are usually not discussed in the literature of international agencies like FAO and World Bank. These include: control over food chains (production, distribution, processing, marketing, and consumption) by few transnational companies, changes in consumption behavior and the role of media, the erosion of traditional or indigenous knowledge, and gender dimensions in food security. Women play an important role in every step of the food cycle in Nepal– from food production and gathering to food preparation and feeding. The lack of women's economic power in the households and various socio-cultural taboos that denies women's access to resources and healthy environment mean that they face discriminations in the access to food. For example, in Nepal, especially among the Hindus, women have to remain content with whatever food remains after all males are fed. They also have to follow difficult and torturous rules (e.g., staying in animal shed while giving birth or during menstruation periods), which is very common in mid and far west, a region that suffers from food insecurity and malnutrition. Women in Nepal have ownership of only about 10 % of the land holdings and about 5 % of the total cultivated land (Adhikari, 2006a). The income of the household/family[4] is generally controlled by males. This deprives women of their choice in food or in controlling the food purchase. Media and its role in changing the food habit is also growing. Industrially produced food, which is often less nutritious in comparison to its price, is becoming popular (Adhikari and Ghimire, 2006). For example, this can be seen in cases where rural farmers exchange a liter of milk with a small pack biscuits or a coca-cola bottle. The change in food habits is also considered as one of the reasons for the growing food insecurity in the Karnali region of

[4] Here household is referred as a group which takes food from the same kitchen. This is the common definition in defining household in Nepal. But now, as household members are now stay in different locations because of their mobility, it is difficult to stick to that definition. Therefore, here household unit comprises all persons having an allegiance to a household sharing the income and other assets. Family and household is also taken synonymously here.

Nepal, where, as discussed above, hunger and deaths have been reported from time to time. Because of the new food habit of the lower hills and Tarai (eg. consumption of rice) introduced in this region, local foods are now not grown and new generations also lost knowledge on these foods. On the other hand, rice is not grown here due mainly to ecological reasons.

Until the recent past, 'food production' was generally equated with 'food security'. The assumption here was that if a country produces enough food (food self-sufficiency), it would meet its food security. But now this is invalidated even though 'production' is one factor in the 'availability of food', and food-self sufficiency is important from various political and social interests. Several research findings have supported this assumption. Some of the critical food insecurity situations manifested in the form of hunger, deaths and malnutrition have occurred in periods where food production was above average. Therefore, even though food production was considered as prerequisite for food security, it was not considered as a sufficient condition (Sen, 1981 and Watt, 1983). These research studies consider also the larger political-economic situation affecting distribution, entitlements and access to food as the cause for food insecurity. The other causes were the breakdown of the traditional food security mechanisms by external forces (colonizers, liberalization, and globalization) and lack of new measures to replace them. This fact has led to the conclusion that food security cannot sufficiently be examined from national perspectives only. Rather, one has to look into micro level processes, encompassing the household level and, if possible, the intra-household level. The need to consider the intra-household level arises from the fact that the household is also a unit within which all forms of social injustice takes place. Discrimination of girls, women, elderly and disabled are rampant in many developing countries. The predominantly existing patriarchal family system, for example in Nepal, creates such discriminations. The new emphasis on ‘access’ to food has also led to changes in the measurement of food security. Now anthropometric measurement (like weight and height according to age, arms girth according to age), food and nutrition intake surveys (like food intake, calorie and protein intake, existence of symptoms of malnutrition like protein-energy deficiency symptoms seen in the forms of stunted growth) and socio-economic surveys (to indicate the food security in indirect ways using various proxies like poverty, real wage rate relative to food prices, employment and demand on emergency food supply situations and the like) are also used to examine the food security situations. These measures usually measure the short-term crisis in food. But for the ‘security’, which means a secured feeling of availability and access to food,

the long-term perspective is necessary. This also asks for the lack of vulnerable situation in the long run. Therefore, vulnerability analysis is much more important. In this paper, the food security situation in Nepal is also examined from the above discussed perspectives.

4.2 Poverty and food security

Even though poverty and food insecurity are taken synonymously in most of the time, they are different concepts. Poverty in general is measured through income, which more or less corresponds to 'access to food' pillar of the food security. Here an attempt is made to analyze poverty and food insecurity. Poverty estimates in Nepal have been made based on 2003/04 NLSS data in which per capita expenditure is estimate at US$266 (current value) per year (Table 1). There is a big disparity in expenditures between urban and rural residents, with US$158 in rural and US$553 in urban areas. Poverty is significantly higher in rural areas compared to the cities. Annual per capital expenditure in the rural Far-West is extremely low (only US$133). The study of Small Area Estimation (SAE) carried out by CBS, WFP and the World Bank indicates that 37 percent of the rural population is living below the poverty line of 7,696 rupees (or US$ 101) per year, compared to 13 percent in urban areas, and 31.9 % in overall. Based on the SAE, the proportion of population below the poverty line is much higher in the Mountain (42.5 percent) among three ecological zones (36.6 percent in Hills and 29.5 percent in Terai) and in the Far-West (45.6 percent) and Mid-West (46.5 percent) among the five development regions. People living in the Mountains spend more on food (65 percent) than those living in the Hills (55.4 percent) and Terai (51.7 percent).

The present estimate (2010) of poverty rate in Nepal is about 25 %, and most of it was considered to be reduced because of increase access to remittances. This has been stated in the approach paper for the 12th Plan by National Planning Commission (NPC).

Food insecurity in the surplus areas of the Terai and Lower Hills is foremost an issue of food access. Although the incidence of poverty in these areas is generally lower than in the Hills and Mountains of the Far and Mid-West, the concentration of poverty (as measured by the number of poor people per square kilometer) is very high (see map that follows).

able 1: Nepal – Per Capita Consumption Expenditure and Poverty Incidence

	Annual Per Capita Expenditure		Share of Food Expenditure	Poverty Incidence
	In current NRs.	In current US$		
Nepal	20273	266	36.9	33.5
Rural	11987	158	54.8	36.9
Urban	42052	553	23.5	13.2
Rural Mountains	11263	148	64.8	42.5
Rural Hills	12927	170	55.4	36.6
Rural Terai	11413	150	51.7	29.5
Rural East	11173	147	58.3	31.6
Rural Central	11516	151	53.7	26.5
Rural West	14854	195	53.7	34.5
Rural Mid-West	11899	156	53.8	46.4
Rural Far-West	10143	133	54.5	45.6

Source: 1 and 2 calculated by this Mission based on MLSS 2003/04 date; 3 based on SAE by CBS, WFP and WB 2006.

Due to high poverty levels, people have limited purchasing power to buy food in the markets. Vulnerable communities such as Dalits, Adivasi, Janajatis and Kamayas often struggle to access sufficient food. The result is that the Terai is characterized by very high wasting levels above emergency levels. Unfortunately, no disaggregated data are currently available that provide insight in the food security situation of marginalized communities in the Terai. Other important factors contributing to food insecurity and malnutrition include limited nutritional knowledge, inappropriate hygiene and caring practices, and the gender division within the household, which places women in a disadvantaged position.

Table 2: Shares of Household Income

	Farm Income	Non-Farm Income	Remittances	Other
Development Region				
East	53	26	11	11
Central	47	32	9	13
West	40	24	17	19
Mid West	52	30	8	11
Far West	54	21	11	14
Ecological Zone				
Mountains	59	19	9	13
Hills	45	28	11	17
Terai	49	28	12	11
Urban/Rural				
Urban	13	54	10	23
Rural	55	23	11	11
Consumption Quintile				
Poorest	62	23	8	7
Second	58	25	9	11
Third	56	24	10	10
Fourth	47	25	14	14
Richest	25	38	13	24
Nepal	48	28	11	14

Source: NLSS data 2003/04.

Farm income is still a dominant source for the rural population, especially households living in the Mountains and households in lower income groups. According to 2003/04 NLSS data, 48 percent of household income comes from arm income, 28 percent from non-farm income, 11 percent from remittance, 10 percent from housing consumption and 4 percent from other sources (Table 2). However, for households living in the Mountains, 59 percent of household income is from agriculture only 19 percent from non-farm income 9 percent from

remittances. Similarly, the poorest and second poorest groups, based on consumption quintiles, are also highly dependent on farm income (62 percent and 58 percent, respectively), while remittances are lower (8 percent and 9 percent) compared to the national average.

The determinants of poverty and food insecurity at the household level in Nepal vary, and they are also complex. These determinants also do not act alone. The combination of these determinants may vary from one household to another and from one region to another. A study on determinants of food security in rural Nepal revealed the following determinants (Adhikari and Bohle 1999).

- **Access to resources**. Access to land and water was the main factor affecting the risk exposure of the households. Access to irrigated lowland suitable for paddy cultivation was found most important. As land holding of households is declining because of increase in population pressure, and a large proportion of households already have small landholdings, other factors related to off-farm activities determine their ability to secure food.

- **Ecological setting:** Ecological setting determines the type of resources available in a certain locality. Harsh environmental conditions put people in a vulnerable condition.

- **Accessibility:** Settlements in accessible areas have relatively better food security. Inaccessible areas faced higher prices on food. They were also politically weaker to put pressure on government and media for relief measures when they were faced with landslides and floods.

- **Marketing opportunities**: In areas where marketing opportunities exist to sell or exchange things that villagers produce, food security was comparatively better.

- **Availability of common property resources:** Common property resources like forest and pasture were helpful for poorer households to derive livelihood. In areas where common property resources existed, people were less vulnerable to various external and internal shocks like flooding, landslide and famine.

- **Family size and composition:** Family size is strongly correlated with consumption of food. Families with proportionately more number of children, and sick and elderly people were found in a vulnerable position, i.e., consuming less food.

- **Ethnicity**: Particularly members of Occupational Caste (Dalits) were found to be in a vulnerable position as they faced discrimination not only in adopting occupations involving food preparations but also in their access to resources.

- **Gender**: Various cultural and political practices were found to make girls and women vulnerable to food insecurity. Lack of mobility for women, access to education and family property, and customs putting women in a lower position was found to make them vulnerable to food insecurity.

- **Social network**: Families with membership in well-to-do households are particularly vulnerable. Social network was important to get relief measures during times of distress, and to get non-farm job opportunities, both within and outside the country.

- **Education:** People with higher educational level were found to be relatively secure in food as they not only know about food and its availability, sanitation, and have information about the political process to obtain food.

- **Political assertiveness:** Areas with high level of political assertiveness were found to receive various facilities from the government and become relatively food secure.

4.2.1 Food consumption and undernourishment

Undernourishment refers to the condition of people whose dietary energy consumption is continuously below a minimum life and carrying out light physical activity. With assistance from CBS, the Mission calculated the mean dietary energy consumption (DEC) and its coefficient of variation (CV) and undernourishment situation at national and sub-national levels by using NLSS 2003/04 data.

At national level, per capita mean dietary energy consumption is estimated at 2405 kcal/per person/day (Table 3). The figure in 2003/04 varied considerably across different parts of the

country, ranging from a low of 2250 kcal in cural Far-Western region to 2534 kcal in rural Western region. In terms of mean dietary energy consumption across the belts of Nepal, the Mountain belt has the lowest consumption level at 2297, compared to 2402 kcal in the Hills and 2426 kcal in the Terai.

The proportion of undernourished population in Nepal depends on the criteria in defining the minimum requirement of dietary energy consumption (MRSDEC). This report estimated the proportion by using three alternative criteria based on existing studies (2124 kcal/person/day4, 1910 kcal/person/day5 and 1810 kcal/person/day6) and the results are also presented in Table. The results show a marked difference depending on which of the requirements used. If the CBS criterion (2124 kcal) is use, as many as 40.7 percent of the population in Nepal live, below the MRDCE in 2003/04. At the aggregate level, the proportion of undernourished population is highest in the Mid-Western region (48.5 percent), followed by the Far-Western region (47.5 percent), while the Western region has the lowest undernourishment (33 percent). Across the belts, the Mountains have the highest undernourishment, at 46.3 percent, compared with 41.8 percent in the Hills and 38.4 percent in the Terai belt.

Although the proportion under different MRDECs is sensitive to the selection of the criterion, it can be concluded that the shares of population under severe deficit of food energy intakes are very high in the Rural Mountains and Hills, especially in the Mid-and Far-Western regions, Table 3 provides more detailed information about the population distribution with different food energy intake levels for 15 groups. The figures indicate that food consumptions in the Mid-Western Mountains and Far-Western Hills are in a crisis situation with more than 30 percent and 20 percent, respectively, of the rural population consuming less than 1600 kcal/per day, which is substantially lower than the international minimum dietary energy consumption requirements.

Table 3: Nutritional level in Nepal

	Mean per Capital Dietary Energy Consumption		Undernourishment Incidence		
	Kcal/Person/day	CV	Below 1810 Kcal/Person/day %	Below 1910 Kcal/Person/day %	Below 2124 Kcal/Person/day %
Nepal	2405	0.776	22.5	28.6	40.7
Urban	2419	0.788	22.7	28.8	40.5
Rural	2400	0.771	22.4	28.5	40.8
Rural East	2427	0.783	22.3	28.3	40.7
Rural Central	2382	0.754	22.1	28.2	40.1
Rural West	2534	0.718	17.3	21.6	33.0
Rural Mid-West	2310	0.875	29.0	36.0	48.5
Rural Far-West	2550	0.689	23.5	32.9	47.5
Rural Mountain	2297	0.784	28.5	35.9	46.3
Rural Hill	2402	0.782	25.1	31.1	41.8
Rural Terai	2426	0.756	18.5	24.4	38.4

Source: SAE, 2006/07.

4.2.2 Nutrition status of vulnerable populations

According to the WHO classification (WHO, 1997) for prevalence of malnutrition, the malnutrition situation in Nepal is at crisis level. During the period 1995-2002, Nepal ranked last among 177 countries (tied with Bangladesh) in terms of the proportion of children classified as underweight (UNDP, 2004). Nonetheless, aggregated malnutrition indicators at the national level show that the nutrition status of children has improved slightly over the past five years (2001-2006). Stunting levels decreased slightly from 51 percent to 49 percent and proportion of underweight from 48 percent to 39 percent. On the other hand, wasting, an indicator of acute malnutrition, increased from 10 to 13 percent (DHS, 2006).

Considerable geographic variation in the incidence of malnutrition can be observed. Detailed malnutrition maps were published by CBS/WFP/WB in September 2006. The highest incidence of stunting and underweight is found in the Mountains and Hills areas of the Far-

and Mid-Western development region, where more than 60 percent of children are stunted and 50 percent are underweight. Limited availability of food and high poverty rates provide an explanation for these high stunting and underweight rates.

In the Terai, on average 17 percent of children suffer wasting. The percentage of affected children in the Far-Western and Central Terai is high as 20 percent and 21 percent, respectively. Factors such as differences in the status of women in society, poor eating habits related to lack of knowledge about nutrition, poor caring and hygiene practices and a higher percentage of households without any assess to land compared to the Hills and Mountain areas are possible explanations for these high levels of wasting in the Terai.

UNICEF and Action Contre La Faim (ACF) have conducted independent nutrition surveys in selected districts, including those affected by drought and adverse weather conditions. Preliminary results from a UNICEF survey show that in Bajura, 72 percent of children are stunted and 70 percent are underweight. For Jumla, the preliminary estimates are even worse, with 82.3 percent of children stunted and 77 percent underweight. Wasting levels recorded for these districts are very high, at 11.5 and 14.1 percent respectively. An ACF survey estimated chronic malnutrition rate at 59.2 percent.

Factors that contribute to this very poor malnutrition situation include:

- Inability of households to acquire sufficient and nutritious food.
- Lack of general education and nutrition knowledge of care providers combined with improper hygiene and caring practices.
- Poor access to health services and the limited medical support available. (The Mission visited a sub-health post in Humla. This particular post receives medical supplies once a year and generally runs out of medicine after two months.)
- Two-thirds of households do not have toilet facilities (Comprehensive Food Security and Vulnerability Analysis –CFSVA).
- Access to safe water remains a concern. Forty-four percent of households rely on public taps. In the Terai, 77 percent of households use tube-wells or boreholes as their primary source of drinking water (CFSVA).

A WFP survey conducted in January 2007 in the drought-affected areas included mid-upper arm circumference (MUAC) measurements. The results indicate malnutrition rates of more

than 53 percent and a further 24.1 percent of children at risk of becoming malnourished. This same survey also investigated consumption patterns of people in drought-affected and non-drought-affected areas in the Hills and Mountains of the Far-and Mid-West. It becomes clear that in general people in this area do not follow a diet that rich in proteins, vitamins and minerals. Fish, meat, eggs and fresh fruit and rarely consumed. The survey shows that in area affected by drought, consumption pattern sharply deteriorate. For example, lentils/pulses, traditionally part of the Nepali diet, were not consumed by more than 50 percent of households within seven days prior to the survey as compared to about 12 percent in non-drought-affected areas. A similar reduction in intake of green vegetables was observed.

These figures indicate a high level of coping intensity and significant impact on health and nutrition in the localized areas that are affected by drought and other external shocks. Given the migration to India is often not a viable coping strategy, alternative income opportunities are non-existent and markets are not functioning in these areas, external support and income transfers in the form of food aid can be justified. Immediate food aid will secure the families' food needs, prevent further deterioration in their livelihoods and reduce long-term suffering.

4.3 Status of food security of Nepal

In this section, the status of food security has been reviewed using the conceptual framework-availability, access, utilization and stability. This will provide an overview on the current situation, associated problems and prospect of the future of food security in Nepal.

4.3.1 Availability of food:

The availability of food through government programs and social network is also important, especially during the crisis period. Of the various sources of food availability in Nepal–own production (i.e., country's production and at household level) is most important. It is generally difficult to analyze the changes in production at the household level. The discussion presented here concerns mainly the production of food at different geographical scale–national, ecological belts, development regions and districts.

For the past several years, Nepal was considered as not self-sufficient in food, as its production growth rate was slower than the population growth rate. This is also revealed from food balance sheets of the country, and the country's net import of food grains and food items. As a result, food insecurity was the prime problem of the country, even though it has

not been receiving the emphasis it would otherwise have deserved. Several reasons have been identified for the lack of sufficient food production in Nepal. Productivity of land as revealed from the yields of food grains have declined for some crops (especially in the hills and mountains) and stagnated for the most crops[5]. This should be viewed in the context that use of fertilizers, pesticides and other inputs have increased as compared to the past. Even though lack of proper infrastructures like irrigation facilities, roads is also blamed for lack of desired improvement in agricultural production, there is also a social reason for this. Agriculture, as a profession, now receives least prestige now (see Adhikari 2000 for detail). It has still been a job for those who cannot find other types of work. Lately, it has been the work of elderly and uneducated people. This has resulted lack of innovations in agriculture. Because of lack good return and backwardness of agriculture, educated people are not interested in this profession. People are also hesitant to reinvest in the development of agricultural sector. The increased labor migration of young and able-bodied persons has also led to this situation (Seddon, Adhikari and Gurung 2001).

The subsistence nature of agriculture is also blamed for lack of rapid growth in agricultural production. From the perspective of food security, there is no problem with regard to subsistence production. Rather, this form of farming system is considered beneficial for the sustainable food security as it is least affected by market failures and vagaries of prices and marketing conditions. Therefore, subsistence production is somewhat proof to these problems, which have sometimes led to food scarcity and hunger deaths. But the problem with Nepalese agriculture is that it is not subsistence in true sense. The subsistence nature of agriculture has been eroding, as it is not able to feed most households for more than six months of the year. This is especially so in the hills. The mountain agriculture is very marginal, and in this region food self-sufficiency has always been low. People of these regions derived their livelihood or secured their food from a variety of enterprises combining food production and trade. Trade and mobility according to season helped them to transfer resources from high lands to low lands and food grains from low lands to high lands.

The situation discussed above contradict the statement that there is high dependence on agriculture as more than 80 % households depend on agriculture. This statement is generally made about agriculture in Nepal. But, even though, a large number of people maintain their farming, they also receive a substantial income from non-farm sources, usually from service sector including labor migration, which is used for maintaining a living in the rural areas. If

[5] In recent times (for the past 3-4 years) yield of crops seems to have increased at the national level (see Annex). But despite these official statistics, it is the general feeling that land fertility has declined significantly.

this income had not been received, a large number of farmers would have been food insecure than what is seen now. But high dependence on agriculture is still continuing, as there is no shift of people from farming to industrial sector in Nepal (see Adhikari, 1996 and Seddon, Adhikari and Gurung, 2001).

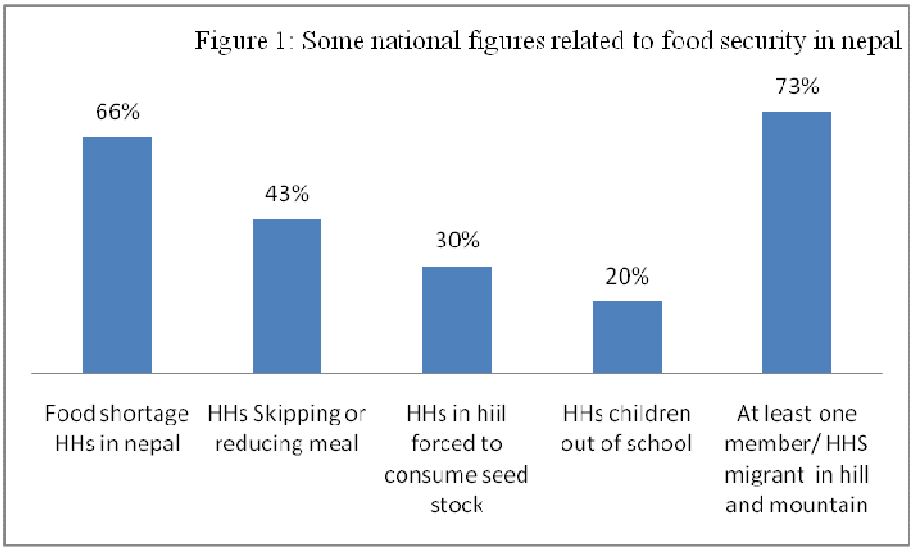
Low landholding and fragmentation of land is also blamed for growing food insecurity in Nepal. At present, Nepali farmers own, on average, 0.9 ha land. This land is also distributed skewedly, so that a larger proportion of farm households have less than 0.5 ha of land. The data indicate that the bottom 20 percent of households receive only 3.7 percent of the total national income, while the top 10 percent capture close to 50 percent (Perry 2000). This land is also severely fragmented, as the system is that land is divided equally to all sons. From this year, daughters are also entitled to get equal share (as compared to sons) on parental property, but need to return to parents (or brothers) once they are married. Even though Nepali farmers' average land holding is 0.9 ha, this should not pose a problem in producing more, provided there is good environment like economic incentives, good technology and required infrastructures. The countries having high land scarcity than that of Nepal are food self-sufficient and also exporting more. For example, in Vietnam, average land holding of a family is about 0.25 ha, but farmers there produce sufficient food not only for the country, and also export rice to the extent of 12-13 % of the world's rice export.

Data obtained from Government indicate that Nepal faced deficit in production in the mid 1990s. But positive balance was obtained since the end of 2000s. There are still uncertainties as to why production increased in this period when there were no any favourable environments for agricultural sector. For example, government's spending on agriculture continued to decline and Maoist's insurgency had adverse impact.

The data available for 11 years (1997/98) to 2007/08 indicate that there was deficit in 1997/98, but there was again some surplus for another eight years (Figure 5). The surplus ranged from 0.3 million to 0.05 million MT. But in 2006/7, there was sudden deficit of 0.2 million MT of food grain, but in 2007/08, there is slight surplus of about 0.1 million MT. Again in 2008/09, the deficit increased to 132916 mt, which was about 2.5 % deficit of the total food required. The fluctuation in surplus and deficit is basically due to fluctuations in weather (rainfall) pattern. When there is good rainfall, production increases. This is because of the fact that irrigation, particularly full year irrigation, coverage is less[6]. In 2006/07,

[6] Data base of Department of Irrigation (Government of Nepal) shows that 745,445 ha land area gets year round irrigation, but the total irrigable land is about 1765,840 ha. This means that about 42 % land area gets full

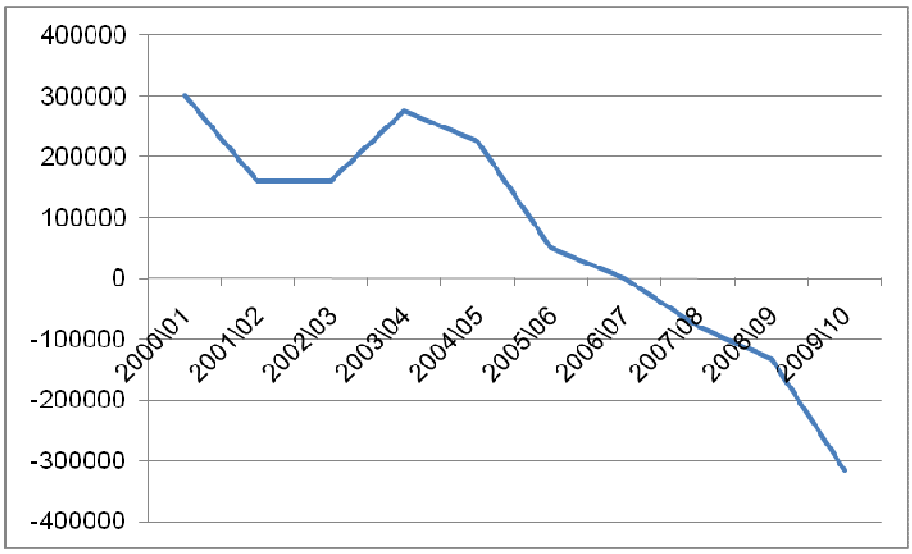
production was very low and deficit reached a low level in recent period. This was basically due to drought, which also continued in 2007/08. It is estimated by WFP, GoN (MoA) and FAO that food deficit in coming years will increase because of decline in production of wheat and barley. This report further writes that, on average, 66% of the HHs in Nepal faces the food insecurity problem. As coping mechanism, 43% households reduced meal, 30% households consumed seed stock, 20% children dropped out of school and 73 % of the hill and mountain HHs sent migrant labour (at least one member of the household). While sending household member away is also a general practice, this has increased in time or number of migrants in 73 % of the household (Figure 1).



It should be noted that this food deficit has been calculated considering the minimum amount of cereals required to meet the 2247 cal. The norms adopted in Bulletin of Agricultural Information published by Department of Agriculture have used in this calculation. In the appendix, the production of different crops in each district for the last 10 years is given. As is the general practice, the main five cereals are taken into account for the calculation of availability of food. The requirement of food has also been calculated based on population and minimum amount required. The minimum amount of food required is based on subsistence economy where other products like milk, meat etc are also produced.

irrigation (http://www.doi.gov.np/downloads/irrigation/). In reality much less area gets full irrigation because in Nepal large irrigation projects are not fully successful. Sedimentation is a big problem in irrigation channels.

Figure 2: Food deficit and surplus in Nepal (MT)



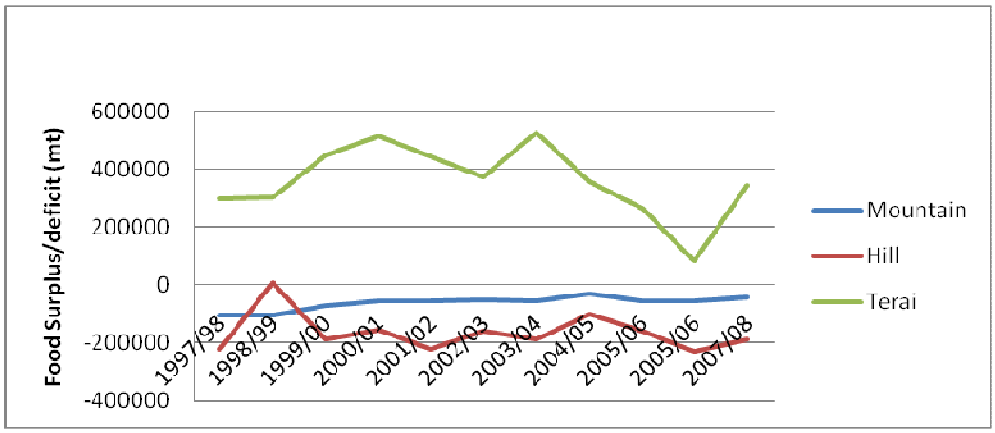
In terms of ecological region, food availability is declining in all regions, but we also see fluctuations. There is also regional variation. Taking the case of Mountain region, the deficit was high in the past in terms of absolute amount of deficit (Fig 2). Then it somehow shows that increase in availability, but the deficit remains. The amount of deficit is also less. One of the reasons for this general increase in food availability could be due to the fact that there is high out-migration from mountain region. Population growth is also less in this region. It is because of outmigration from mountain region that availability of land per household has in fact increased (Adhikari, 2009). This increase in per capita (i.e. per household) land availability could be one of the factors for stabilization in the food deficit/surplus here.

The food production in the hilly region is very fluctuating (Fig. 2). This correlates to weather patterns. Because of the sloppy nature of land and less availability of plain valley land, it is also difficult to develop irrigation. As a result, much land in the hills is rain-fed. Therefore, there is fluctuation in production of food. This fluctuation has increased in recent years because of disturbance in normal rainfall pattern. This is considered as one of the impacts of climate change. In general, there is also declining trend in production of food. In the last two years, deficit has grown.

The situation in Terai (Fig. 3) also indicates that food production is declining in general. But there is drastic reduction in production in the last two years. Terai has been considered

as bread-basket of the country. In the past, it used to supply food to other regions. In general, there has been some surplus production in Terai, but in the last two years, there has been a marginal surplus only.

Figure. 3: Food deficit and surplus in different ecological belts (MT)

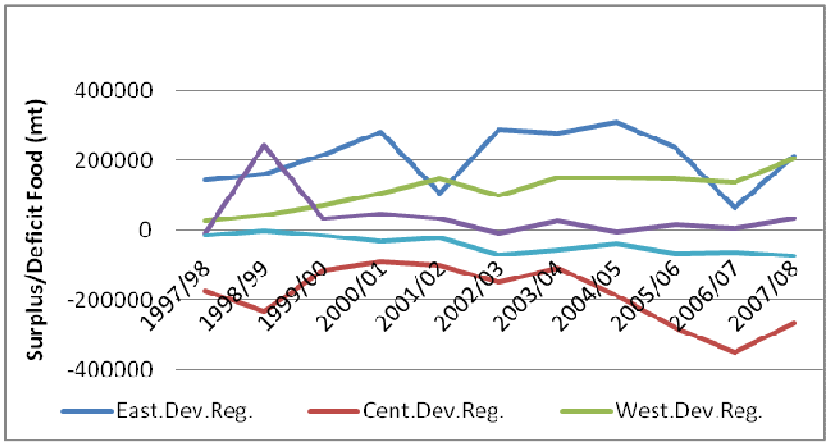


In terms of development regions, eastern and western development regions are surplus in food, but they are also showing declining trend (Fig 3). The Eastern Development Region which used to produce significant amount of food over its requirement is also facing a declining trend in food production, especially in the last two years (2005 and 2006). The production of Western Development Region is consistently increasing except in the last two years (2005 and 2006). Food deficit is extremely high in Central Development Region, which includes Kathmandu valley also. But food crisis is not generally heard in this region. One of the reasons for this is that it has access to market and food is available in the market for the purchase. But of course, this Region is also diverse in terms of urbanization and accessibility to road.

Kathmandu, especially the urban Kathmandu, has its own problem in food security. It depends upon other regions and India for food. It also has high income level and poverty rate is about 4 % against the 31 % of the country (CBS et al 2006). But malnutrition is also high here, i.e. comparable to other rural areas where poverty rate is very high. The reason for this goes to food habits. Increasingly urban kids buy fast food and packaged food, which are also expensive for their nutritional values. This has negative impact on their health.

The overall situation of Mid-Western region is that food production and sufficiency is fluctuating here. But in recent years, this has also been declining. On the other hand, there is wide disparity within this region. The Terai of this region produces more food which balances the average situation of the region. But as seen below, the situation in hilly and mountain regions within this development region is precarious. The Far Western Region is deficit in food production consistently in recent years. But there is again slight increase in 2007-08.

Figure 4. Food deficit/surplus in development regions



The analysis of surplus and deficit in food balance was done using the five major cereals (rice, maize, wheat, millet and barley). But it is also a fact that many more other crops are grown. Other important crops and commodities like livestock products, poultry, fish, vegetables, fruits, buckwheat, beans, oat, tubers (yam, taro, sweet potato etc), and potato are not included in the food balance sheet. These crops and commodities have been increasingly contributing to food and nutrition security as they are supplying calorie, nutrients and cash income to people but they are not counted in food security calculations (Dahal and Khanal, 2010). Potato for example is mostly used as vegetable in Terai and urban areas but it is consumed as staple food in the hill and mountain districts. In 2008-2009 the total production of potato in the country was 2083283 mt. which if included in food balance sheet, the average food availability per capita per year would be 248 kg which is much higher than the national requirement of 191 kg. With the addition of potato alone the country would be surplus by 1594040 mt. and there is no sign of food shortage in the country at least at the national level. The food availability surprisingly seems highest in the mountains with 312 kilogram per capita per year. Mountain area produces more potatoes also. This clearly shows that there is no problem of food availability in Nepal, but it could

be a question of food distribution or access to food and food habit. Because of growing influence of dominant food, the minor foods are not considered as food. Moreover, there is a need to produce a more variety of food based on potato. In Europe, potato is considered as main staple and there are different ways of consuming this. May be this needs to be explored in more detail.

Food availability at district level:

District level food production sufficiency for the last 11 years is shown in the figure 6. It is extremely difficult to analyse the case of each district. In order to simplify the food sufficiency of the district, Table 4 has been prepared, which show the number of food deficit districts in each eco and develoment zones. This is for 2006. The Table shows that out of 75 districts, 49 districts could not produce sufficient food. In general, more of mountain and hill districts are food insufficient. But it is also interesting that more than half the Terai districts have become unable to produce sufficient food. This happened due to following reasons: in the past, there was population concentration in terai because of hill to Terai migration. In the last 4 years, conflict has been intense in terai. As a result development initiatives are low.

In general, Terai is food sufficient, which has already been discussed. But the capacity of Terai districts to produce sufficient food has been declining. This is going to put pressure on national food security. Because of worldwide decline in food in recent times, governments are particularly concerned with food exports. India has been banning food exports for the last three years. If Nepal as a country cannot produce sufficient food and there is ban in export of food in other countries, it could face serious problems (Adhikari, 2008).

The number of districts with deficit food production varies from year to year depending upon production conditions like rain and incidence of insect and pest. In 2003, 43 districts were deficit in food production. In general, the trend is that number of deficit districts is growing despite fluctuations from time to time.

Table 4: Food deficit districts in 2005/06 (figures in parenthesis are total districts in each region/belt)

Ecological belt	Eastern region	Central region	Western region	Mid-Western region	Far West region	Total
Mountain	0 (3)	2 (3)	2 (2)	5 (5)	3 (3)	12 (16)
Hills	5 (8)	7 (9)	5 (11)	5 (7)	4 (4)	26 (39)
Tarai	3 (5)	4 (7)	1 (3)	1 (3)	2 (2)	11 (20)
Total	48(16)	13 (19)	8 (16)	11 (15)	8 (9)	49 (75)

Source: Calculated based on production data from Statistical Year Book of Nepal 2007. Kathmandu: Central Bureau of Statistics (CD obtained from there). The detailed of calculation presented in Excel file.

Availability of food through other sources:

Apart from what people can produce or buy from the market, food is also available through government mechanisms and social or traditional practices.

Food Aid has become a source of food availability in areas where there is food deficit. This is especially in Far West and Mid West regions, where food crisis has been occurring since the 1972. Initially food aid was considered a temporary phenomenon. But it became a permanent feature and dependence on food aid is also growing. While food aid is still in small amount as compared to local production, but growing food deficit has made the food aid imperative in the country. Some of the programs related to food aid target malnourished women and children. A basic problem in relation to food aid has been that it has not been linked with increase in food production through local means. In few cases, it is also seen that people have a sense of psychological dependence on food. In few areas, especially in locations where subsidized food is available easily, there are indications that people do not work as hard as in the past to meet their own food security.

While food aid will be required until people face food deficits, or the institutional mechanisms to provide food during emergency is also required when people become able to

meet their food requirement through production or through market, attention should be focused on producing more foods through local means. It is also seen that food aid is required because there are no transportation facilities to supply food through market mechanism. In food deficit areas, food price is high mainly due to transportation cost.

Nepal Food Corporation (NFC), WFP and other non-governmental organizations are responsible for supporting people in terms of food security or nutritional improvements. Of these, NFC and WFP are major agencies to make food available and improve accessibility of targeted people. But the total supply of food from these agencies is only a small part of the total food required in the country.

The role of NFC has shrunk in recent times and the volume of food it supplies has been declining. This has happened mainly because of neo-liberal policies adopted since the 1990, which aimed at reducing the state's involvement in social sector. In the past NFC was mainly responsible for supplying food to Kathmandu. Only in the later period, emphasis has been shifted to remote and food deficit areas. NFC only provides transportation subsidy to remote and rural areas.

In the 1980s and up to mid 1990, NFC continuously increased its supply of food grains to rural areas, even though there were fluctuations also. It averaged around 50,000 mt per year in this period. But at present, it supplies only about 9,000 mt per year.

Even though, government has been shouldering a large amount of subsidy to NFC for the supply of food to remote areas, the contribution of NFC to meet food deficit is very small. It Kathmandu valley, the contribution of NFC's sales meet only 15.5 % of food deficit as of 1997/98 (Adhikari and Bohle, 1999). But for 2002, the estimate is only 9 % (Pandey, 2002). Overall, NFC's food sales meet only 3 % of the food deficit of the country. The rest of the food deficit is met from the private sector. Pandey argues that main problem with the private sector is with the quality control. Kathmandu food supplied by private sector has been adulterated and is of poor quality. In various reports and newspaper articles, complains about food quality are common.

Distribution of food to remote areas from NFC has also not been very effectively distributed. Even though it has placed a heavy financial burden to supply food to remote areas with no

transportation facilities the questions often raised whether the real food insecure households have benefited from the NFC's supply. After Jumla was hit by a famine in 1975, government took steps to send food by air lifting. Since then government has been providing food to Karnali and other food deficit hill districts, and amount has been increasing year after year. But the benefit of food distributed in Karnali, which is considered as the most insecure zone with 5 districts; It also receive about 40-50 % of subsidized food. In terms of total subsidy, proportion invested here might be even more as transportation is costlier here) have been taken either by Helicopters or by Wine makers. In 1998, NFC's 60 % meant for Karnali districts rice was allocated to government people and teachers. Rice supplied by NFC in Karnali is just not sufficient to meet the demand of people (Khadka, 1999: 261). In the late 1990s, government spent Rs 200-250 million in the transportation of food in the Karnali zone only. But in the past two years NFC has been receiving less than Rs 225 million as transportation subsidy for the whole country. But the problem is that the agricultural production has been deteriorated from this subsidized food supply. As the food supplied by government is cheaper than to produce food locally, people now give less attention to the production of food.

WFP's has also become a main player in providing food to people. It is providing life-saving food assistance to 3.5 million vulnerable people living in 40 of Nepal's 75 districts. Under Food Assistance for Populations Affected by Conflict & High Food Prices, WFP is providing food assistance to 2.7 million people struggling with high food prices and impacts of conflict and natural disasters to improve their immediate food security and to enable families to invest in creating assets to rebuild their livelihoods. Internally displaced people (IDPs) and children associated with armed groups and armed forces are also receiving food assistance to ease return and reintegration into their communities. WFP is also creating a foundation for healthy minds and bodies by providing fortified food to vulnerable women and children through school feeding and maternal and child healthcare programs. Incentive programs encourage girls to attend school by providing them with take home rations of cooking oil when they maintain levels of attendance. WFP also provides food assistance to Bhutanese Refugees which number more than 102,000 since 2001.

Until 1950s, various types of traditional social mechanisms of food security were prevalent in different parts of the country. In the past, most villages in western Nepal used to make religious storehouse of the grains (*Dharma Bhakari*), in which every household would contribute food according to their capacity. This food was then given to those people facing crises in feeding the family. The wealthier households had various obligations towards the

people who provide services to them. During the times of distress as well as during festivities, they need to provide food. Similarly, people facing disasters used to be provided kin members and neighborhoods had to provide food and shelter. In Jumla co-operative societies have been working since the last 500 years. These co-operatives have been managing irrigation facilities. There are other examples of managing resources and labor through traditional co-operative system. These resources being owned in common had been useful for the livelihood of the poor people. For example, 'Newa' system of forest and pasture management among Sherpas, 'Riti-Thiti' system of Gurungs and the like have been useful in protecting common resources.

Even though many of these social practices of the past were helpful for food security, society was also feudal restricting the mobility of poor and disadvantaged. The distribution of power and resources was often unequal. The patron client relation that helped to some extent was not empowering the people. As a result malnutrition and low food intake was also common in the past. Due to lack of government policies, there was no program for helping the food insecure households. But the availability of common resources in plenty also acted as a cushion against the shocks arising from low resources and production. Due to modernization and the consequent rise of monetized economy, the traditional moral economies helping in the food security have been severely eroded. The new role taken by modern state in providing various services and security to people is also partly linked with the erosion of the traditional safety nets. But in the context of Nepal, it seems that it is in a transitory phase – traditional safety nets have been broken down but the modern state is not solely capable to provide the food security situation.

Trade in food (food export and food import):

Until the 1998/99 Nepal has turned to be a net importer of food grains, but in the past, export of food grains was a main source of income to the country. Because of porous border between Nepal and India, Nepal exports food grains and also imports some. But, on balance, Nepal now imports a lot as compared to its export. In 1998, Nepal exported food and live animals worth Rs 5.3 billion. But on the same year, it has imported food and live animals worth Rs 7.7 billion. The trade deficit on food trade is growing, which means that Nepal imports more food than its exports. In 2007, Nepal exported Rs 9.1 billion worth of food, but imported Rs 18.6 billion worth of food.

Nepal's leading food exports are vegetable ghee and pulses followed by live animal, cardamom, tea, sugar and ginger. Vegetable ghee and live animal are major exports to India. Ginger has come out as one of the major food exports to India in the recent years. Pulses and Cardamom are also the major food exports to India along with Pakistan and Bangladesh. Tea appears as major export item to overseas countries outside South Asia region. . Sugar, which was less traded item in the past, turned out as a major export item in the recent few years. These seven major export items share above 55 percent of Nepal's food trade. Nepal also export the major cereal products (particularly high quality basmati rice) but the major cereal are not country's export potential since country has to high trade deficit in these crop and there is significant food aids. India is the leading trading partner, followed by Bangladesh and Pakistan. India accounts about two-third of the total trade.

Photo2: Importing of flying rice

Among the major cereal grains, Nepal is net importer of rice, maize and its products and other cereal products. In 2005, there was slight balance in the trade of wheat. But in 2004, Nepal imported wheat than it exported.

4.3.2 Access to food

Access to food essentially represents the entitlement to food through various measures. The most important of these entitlements is the exchange entitlement through income. Therefore, it is assumed that if people have income, they can exchange this with food. Food access is ensured when households and all individuals within those households have adequate. There are other types of entitlements like social and cultural provisions, government supports through food stamps or food aid or other measures and the like. Therefore, food prices and income determine access to food in today's market economy. Access to food may also depend on infrastructures, transport, connectivity and food policy adopted by the government. Although the per capita gross domestic production has been increased to US $ 470 in 2007-08 from US $ 390 a year ago the poor and vulnerable sections of society have difficulty to access adequate food in both remote districts as well as urban centers (Dahal and Achayra, 2010)). As the private sector's involvement in food grain supply is limited to accessible areas

and urban centers, Nepal Food Corporation under the Ministry of Commerce and Supply has been taking responsibility to supply food grain to the food deficit remote districts. But the capacity of NFC to supply food grain to the remote districts is limited by high transportation costs, inadequate fund to purchase food grains and lengthy procurement rules. The annual supply of food grains of NFC has declined in general from its peak of 72747 MT in 1993-94 to as low as 14022 MT in 2004-05 (CPP, 2007 as mentioned in Dahal and Acharya 2010). The food demand however has been getting high in remote districts in the recent years.

Generally access is analyzed at individual level, but in most food security analysis, the unit of analysis is considered at household level. However, the access position of all members in the household is not same. This is particularly so in terms of gender, and to some extent, age. Based on the equity principle, no food security can be achieved without gender equality. Gender aspect of food security is critical to social, cultural, economical and political dimensions of individual and household and even at national level. In most developing countries, rural women are the mainstay of small-scale agriculture, farm labour, and day-to-day family subsistence. Efforts to alleviate rural poverty and improve food security will not be successful unless issues relating to women as producers and providers of food are taken into account. These issues include the contribution of women to household food supply and income, access to productive resources, and the impact of policy reforms on the economic and social roles of women and household food security. Though the household food security is the function of the income, relative expenditure pattern and societal traditions, the responsibility to manage largely falls on women and which is sophistically determined by women's access to income, assets and access to household decisions on expenditures. At present, only about 10 % women have access to land, which makes them subservient to male. As a result, they are not encouraged to maintain food security at the household level even if they would like to do that.

Gender relation to food security (nutrition) should be analyzed in a lifecycle approach starting from birth where a female birth gets less importance and therefore, starts suffering innumerable discriminations including differential treatment in nutrition intake. Such discriminations are promoted by the culture when they are treated as second class, sub-ordinate and even docile. A girl brought up in discriminatory practices, discriminations are moderate to severe based on caste, class, culture and geographic area is always willing to dictate and follow same practices in the family keeping the vulnerability unbreakable.

Women's food accessibility is more deteriorated if she is poor, disabled, unemployed, single and of lower caste.

4.3.3 Food utilization

One of the main features of food security as discussed above is the access to sufficient food by all people at all times. To examine whether this situation exists or not, surveys like health surveys, nutritional surveys or even food consumption surveys are conducted. The analysis of food consumption (or nutritional status) is more important than the analysis of food availability, as households not producing food may be consuming sufficient food through other exchange systems like purchase, exchange of food through labour or other assets/property, by becoming a member of a kinship group or other social groups having access to food, or by borrowing food or money to purchase food.

Various nutritional surveys conducted in Nepal reveal that the nutritional status of people, usually of children, has been deteriorating. A national survey conducted in 1975 revealed that 48.1 per cent children had suffered from chronic malnutrition and 6.6 per cent children had suffered from acute malnutrition. A survey conducted in 1995 revealed that 63.5 per cent of children suffered from chronic malnutrition and 6 per cent from acute malnutrition. The Nepal Family Health Survey (NFHS) and Nepal Multiple Indicator Surveillance (NMIS) conducted in 1997 revealed that 48.4 per cent and 53 per cent children suffered from chronic malnutrition, respectively, and 11.2 per cent and 16 per cent from acute malnutrition, respectively.

Nutritional surveys conducted in Nepal in 2001 and 2006 also reveal that nutritional status of people, usually of children, has been deteriorating. The recent surveys that are worth mentioning–Nepal Living Standard Survey (2003-04) and Demographic and Health Survey, 2006, have identified the groups of people suffering from various foods insecurity (mainly nutritional factors) problems. It shows that about 40 % people consume less than the required energy (2240 Calorie) in 2003-04. Stunting among the children (below 5 years) has remained more or less same in the period from 2001 to 2006. But during this period, the incidence of underweight has declined significantly, from 45 % to about 37 %. On the other hand, incidence of wasting has grown significantly in this period. There is also variation in the type of malnutrition according to ecological regions and development regions. In terms of calorie intake and stunting, High Mountain and Hill regions suffer

more. But in terms of wasting, Terai seems to have severe problem. Similarly, the problem in Mid Western and Far Western Regions is far more serious than the other regions.

The nutritional security or the status of nutrition among children is also dependent on many social factors, including the status of women and girls in society. This status is the accumulated effects of various other factors like violence against women and illiteracy, which in turn affect access to health and sanitation knowledge, the decision-making role of women, intra-household food distribution practices and fertility rates. The cultural practices that put women in a lower position reduce their empowerment within the family. Thus, they have less access to food and other resources. This leads to low health and food security for women. The children of such mothers also suffer from health and food insecurity. This is more common in Terai caste society, where women's health condition is poor because of gender discriminations. The gender discrimination index in Terai districts is very low.

Table 5: Poverty and food (nutritional) insecurity according to ecological and development regions.

Region	Poverty Rate (%)	Population not consuming minimum calorie (%)	Stunting among children below 5 years (low height for age) (%)		Underweight among children below 5 years (low weight for age) (%)		Wasting (low weight for height) among children under 5 years age (%)	
			2001	**2006**	**2001**	**2006**	**2001**	**2006**
Nepal	**30.8**	**39.9**	**50.4**	**49.3**	**45.2**	**38.6**	**9.6**	**12.6**
Ecological zone								
Himountain	32.6	45.2	61.4	62.3	45.1	42.4	5.3	9.4
Hill	34.5	41.8	52.4	50.3	41.4	33.2	5.9	8.4
Terai	27.6	37.4	47.3	46.3	48.4	42.3	13.3	16.6
Development Region								

Eastern	29.3	37.6	47.6	40.3	43.4	32.9	9.1	10.1
Central	27.1	39.9	50.0	50.0	44.7	38.2	10.8	13.8
Western	27.1	37.2	50.1	50.4	43.4	38.5	8.9	10.9
Mid-Western	44.8	44.3	53.9	57.9	49.0	43.4	8.8	11.6
Far Western	41.0	44.9	54.0	52.5	48.9	43.7	8.8	16.7

Source: CBS, WFP & WB. 2006; USAID, New Era, MoHP, 2007

4.3.4 Stability

Political instability and disharmony in recent times was also one of the reasons for food insecurity in Nepal. Due to Maoist problem, food production had declined severely in the hills and some mountain areas. A large number of young people were displaced from their place, as they were caught between the army and Maoists. Moreover, the supply system of food had been disrupted severely in the areas (26 districts) affected most by Maoist insurgency areas. Most of the food insecure districts belonged to Maoists affected districts.

Small and fragmented land holdings, lack of basic infrastructures like year round irrigation facilities, accessibility for marketing and purchase of inputs, appropriate technology, land degradation and continually increasing population pressure on land due to inheritance system are some of the factors resulting low growth rates in agriculture. Sizes of landholdings are usually too small to produce enough food grain for the household to survive throughout the whole year. Poorer people not only have less land, but their land is also unproductive and marginal. As a result, their land is more prone to land degradation. Poor farmers also do not have capacity to purchase external inputs and increase irrigation facility. Moreover, as farming will not give them full employment and livelihood, they usually pay less effort to intensify or develop agriculture. Rather, they go for other opportunities to earn livelihood like out-migration, which can be seasonal or temporary.

Even though mainly wealthier households own quality land, they also tend to show less interest to modernize farming. They do use more inputs as compared to poorer farmers, but they do not do so in a proper and balanced way. As a result, it has negative impact on the soil and environment. Because of the greater risks in farming, owing to lack of market, stable price, diseases and pest and natural hazards like hailstorm, landslides and flooding, farmers usually do not like to invest (reinvest) in farming. There is no insurance system and price

support, which hinders both wealthier and poor farmers to invest in farming. As a result, the general tendency of farmers is to leave farming as subsistence-oriented and traditional, and look for opportunities to earn cash income elsewhere.

Nepal was considered as a food secure country until the mid 1980s. This assumption was made as the policy making and planning in the past had the assumption that food self-sufficiency at the national level meant that it would lead to a food secure situation. And Nepal was food self-sufficient in the past. It even exported a larger part of its production. A food balance estimates made in 1970-71 showed that the country had 294,051 MT surplus food grain. This surplus was evident mainly because of greater surplus in the Terai where population density was lower. The food production in the hills and mountains was in deficit even then. In 1970-71 34 districts had food deficits – 6 in the mountains, 26 in the hills and 2 in the inner Terai – while 18 Terai districts had a food surplus (Gurung 1989:203). Similar estimates made in 1974-75 revealed even greater amount of food surplus in Nepal. This study showed that Nepal had an overall food surplus of 539,160 MT. But, at the same time, 29 districts (11 mountain, 16 hill including Kathmandu, 1 inner Terai and 1 Terai districts) were food deficient in that year (ibid:206).

Despite surplus shown in the early 1970s, various studies also claim that by late 1970s food was already in deficit in Nepal as a whole. But food was exported despite these deficits. This indicates that food was exported from Terai to India and other countries, but the hill districts remained food deficit. This happened mainly because of lack of physical and economic integration of the country. The hill districts were largely inaccessible then. Even some part of the country had to be reached by passing through India. In 1977 overall food deficit was estimated as 1.5 % of food production. But recalculations revealed that the food shortage was 15-19 % in 1976 and 18-22 % in 1977 (ibid:214). Food insecurity was a serious problem when there were unfavorable climatic conditions in 1972 and again during the drought of 1980. Food had to be imported on a large scale to meet the deficit. Nepal also received food as gifts from various friendly countries to meet the shortages. Even though no hunger deaths were reported then, there could have been some problems in the hills and mountains, as media, because of inaccessibility, might not have covered them.

It is extremely difficult to tell objectively how much food is produced in Nepal and how much is imported. There is also large variation from year to year because production depends on rainfall and other production conditions. But, in general, country is facing problems in meeting the local food needs. At present, it is estimated by World Food

Programme (WFP) that the country can meet only about 80 % of its food requirements. But government's estimates that the country food production can meet the basic requirements of food for its population (see discussion below). Food production fluctuates depending upon the weather situation, and it has become a cause for concern. Lately increased incidence of drought is leading to severe food insecurity. In early 2009, it was estimated by World Food Programme (WFP) that about 2.2 million people of Nepal, particularly Far Western and Mid Western Regions, will face food problem, mainly because of the drought. Agricultural productivity has also been declining because of the unbalanced use of chemical inputs. On top of this, the conflict has exacerbated food insecurity in villages as it adversely impacted on both the production and distribution of food.

5 Food insecurity in Karnali

In the past, Karnali was considered a prosperous region for its subsistence agriculture. It is still a place with immense potentialities, but now suffers from food deficits, diseases, and various unfulfilled basic needs. Now Karnali has been known as a typical case of exclusion, deprivation and dependence in all aspects of social life. It is a case of failure of government's policy on agriculture and food security. Many of the unintended consequences of the development programs also played an important role in growing food insecurity in the region.

For a long time, Karnali was in isolation. We did not know much about the situation in Karnali. But these days, we hear and read about impending food shortages and consequent hunger and deaths in Karnali. Karnali is dependent on external sources for food and other developmental activities. The government started supplying food to Karnali in 1976 to ease the problem caused by famine. At that time, most had assumed that this support, i.e., external food aid, would be a temporary measure. But it continued and its volume seems to have increased. In 2004 and 2005, the government spent Rs 140.6 million and Rs 152.4 million for food aid in Karnali alone. Considering the expenditure for food aid in Karnali since the 1970s, billions of rupees have been spent. But the condition of people in terms of food security is deteriorating (Adhikari, 2008).

According to a recent report (WFP and OCHA 2007), two-thirds of the Village Development Committees (VDCs) of Karnali have been suffered from high to severe impact of the conflict. There was a direct correlation of intensity of conflict with its impact on livelihood. Therefore,

the livelihood systems of these VDCs were severely and adversely affected (see Seddon and Adhikari, 2006). Hunger and famine have now been regular features in Karnali. The food crisis continued in Karnali even after the peaceful ending of armed conflict. In early 2008 too, the food crisis is reported to have occurred in the mid and far west, especially in the five districts of Karnali. The food stocks at the household level have decreased by half because of the constraints in supply and increase in price.

Another report published in June 2008 revealed that more than 300,000 people in nine districts of mid-west and far-west regions of Nepal were suffering from food insecurity because of severe drought and increase in food prices (Relief Web 2008). Drought that occurs frequently in these regions compounds the food insecurity problems because it leads to decline in local production on which people have control. WFP (2008:3) states that 80,700 people in Karnali zone (42,400 in Kalikot, 18,800 in Humla, 14,300 in Mugu and 5,200 in Dolpa) were at risks of food insecurity in June 2008. The increase in food prices that occurred during this time also had negative impacts on food security (Adhikari, 2008), which increased migration to India.

One of the reasons for decline in food security in Karnali is decline in local self-sufficiency in food, i.e., decline in local production. It has always remained a food deficit area. However, in the past, it seems that the food culture and practice of growing different varieties of crops, the low population, and internal exchanges and trade helped to mitigate the food deficit. The capacity for exchange entitlements was also high.

The data show that most districts, and Karnali as a whole, were food surplus until the late 1960s, except for Humla. Humla was food-deficient even at that time. But in recent times, all districts are food-deficient and this deficit is growing. Jumla district, even though food deficient, seems to be able to reduce the deficit, but in all other districts the deficit is growing. This deficit has been growing very rapidly in Humla, followed by Mugu. Kalikot and Bajura which was food self-sufficient until the mid-1970s, has become food-deficient and the deficit is growing.

In recent times, Karnali has lost its traditional food producing capacity and food securing mechanisms. On the other hand, it has not been able to bring new developments in food production. This transition has been a huge burden on the people of Karnali. The present

generation seems to be a lost generation in the sense that they cannot go back to the tradition as much of it has already been lost. On the other hand, they cannot move forward as they were adversely affected by their integration to the wider world and State has not been responsible to them. For example, they have lost much of their traditional farming, food and food habits.

The traditional farming system in Karnali has been characterized by wide diversity and adaptability to the agro-climatic conditions, which also varies from one small unit to another. Because of the need to adapt to the very diverse agro-climatic regions, farmers have developed a wide diversity in crop-growing practices, crops, and in social practices, including food culture, exchange practices and social relations. The food like different types of millet, *chinu/kamunu, marsya, uwa/nafal* and uncultivated foods etc. have lost value. It is estimated that 25 % of the food comes from these minor crops (Field survey, 2010). But increasingly, they are not used as food because of the influence of dominant food like rice.

The impact of climate change has also been in Karnali. The variability in climatic conditions and reduced snow and water level in rivers and channels in winter has caused reduced food production. Similarly, there has been increase in temperature as revealed from the data obtained from meteorological station and discussed in Adhikari (2008). Similar concerns have also been raised in other high mountain areas. Karnali region is one of the areas badly affected by climate change. Any area which is dry (Karnali is relatively dry as receives less rainfall) is adversely affected by climate change as compared to areas which have high rainfall. Moreover, increase in temperature could also bring some opportunities for crop production, and how far these opportunities can be tapped need to be studied and analyzed with experiments in farmers' field.

In summary, within the existing structural inequality, the way development intervention is being facilitated, is aggravating the situation by widening the gaps, creating dependencies and frustrations among the local people. The majority people in the study sites are deprived from access to and control over livelihood resources, high level of social inequality and exclusion, increased food insecurity with the declining agriculture production and productivity. At the same time, food security situation has been perceived at alarming stage, everyone is concerned with the food aid and assistance, food for work and services. There are little or no efforts in place to improve production system, inputs and services.

The discussions made above reveals the severity of the food crisis in Karnali. The severity is caused by both internal as well as external factors. The following are the main factors to contribute:

- Dependency syndrome– it is mainly created by development agencies by means of providing assistance without preparing communities to internalize and absorb such supports and leaving many loopholes to capture benefits by elite groups. There is growing expectations among the poor and deprived however increasingly turning towards frustrations aggravated by false commitment of agencies from outside as well as political bodies.
- Physical exclusion and difficult terrain- Karnali has been experiencing physical or geographical exclusion. Its impact is seen in their inaccessibility to state facilities as a citizens. Because of geographical exclusion, Karnali people were not able to enter the government service and thus could not influence the policies. Similarly, Transportation is still very difficult. A kilogram of rice which costs Rs 20 in the plains requires Rs 50 to 60 for transportation, especially when transported by air. Karnali is a road-less region even today, although a track has recently been opened.
- Social inequality– historically rooted structural inequality like caste discrimination and gender inequality is very prominent in this region. This has also contributed to differentiated access to and utilization of food and other livelihood resources increasing vulnerability and food insecurity.
- Decline in internal exchanges and the new food custom - local food system of Karnali was influenced by the external foods, leading to the weak local production base. It is not only those local foods are not consumed, but the use of junk food like packaged food (like biscuits and noodles) has increased. Food aid is also one of the reasons for the decline in the food production and change in food habit.
- Government neglect and discrimination - Karnali was discriminated for the historical reasons and it was left to local revenue functionaries to extract the revenue but no development work was done to improve the living conditions.
- Climate change and its adverse impact– increasingly the climate change effects are becoming visible. This region is relatively dry and more adverse impacts are likely to occur. There are clear indications it is affecting agriculture and livestock production severely.

5.1 Food Security Situation: changing landscape at village level

"Until there is possibility of receiving and taking food from outside, there will be lack of food, if there are not any options people work on farm then there will not be any hunger. During Maoist insurgency production rather increased as people had to work and could not spend time lazying around like play cards and drinking alcohol. This production was enough for both the locals and the hundreds of outsiders who visited there in different programs of Maoist party. Dependency on aid and outsiders cannot lead to sustainable production. After Maoist signing in the peace treaty, the food insecurity and dependency of food aid increased because the organizations providing food aids increased who presented that people of Karnali is in need of food aid" Aangraj Budha, an Activist from Bhee V.D.C. working with Janasewa.

During the Maoist insurgency, they engaged raising awareness and organize local communities including agriculture production activities. It was partly their strategy to engage their cadres and partly to motivate local people that Maoists were doing for their betterments. However, the approaches they adapted mobilizing communities forcefully did not lasted after their departure.

Field discussions in Bajura and Mugu suggests that although the food insecurity in this region was an severe issues for long time, there was no political commitments as well as development actions prior to Maoist insurgency. According to villagers, during the period there was not perceived need as well greed for food from outside. The food was locally available not only for the villagers but also for the insurgent who were in the number of hundreds. However, after peace accord in 2062, when Maoist left the villages, the demand for outside assistance for food was lauded.

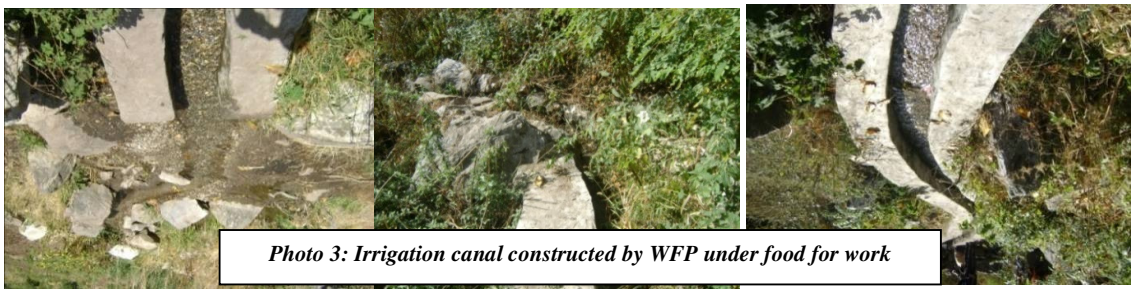


Photo 3: Irrigation canal constructed by WFP under food for work

The level of expectation raised for food aid is unbelievable. Either in group or in individual conversation, all have single voice that they lack livelihoods resources and need support for survival. This is partly true that there are certainly many chronic problems of food production

and availability but at the same time, there is very high level of expectations. Every member of the villages is asking food for work. There are many construction activities organized through food for work scheme. However it is frustrating to know very few have been successfully completed. The motivation to developmental activities is guided by the outside assistance rather internalized development by self.

In general, none of the village is food secure, poor and marginalized people are making their livelihoods through off farm activities; mainly in construction works, seasonal migration. The local food system is detached from the local production systems. Similarly, the food culture as well as food habits are changing rapidly with the influence of growing market economy all over the country. To some extent the economically poor farmers still rely on their product for the food items but it is considered as poor state rather a choice by the individuals. The food habit and culture of local food item use is deteriorating day by day with the influence of market economy at all level. This is one of the reasons of food deficit in the villages.

The food and agriculture landscape have changed dramatically in the region, which is not well communicated. The interaction with community people and field observation confirmed many of the issues raised in the past as well as recent reports. Increasing population size, decreasing agriculture production and productivity and changing socio-economic as well as micro environment are the major causes of changing food security landscape at village level. The food insecurity trends are increasing each year. Increased food supply, reduced temporary migration, climate change effect and changing food custom are fundamental factors to affect the trends.

"We all are farmers and Nepal is agriculture based country. So we should never leave farming. If we have money we can buy rice from NFC if don't have then how can we survive? NFC and aid from outsiders will not be forever. We shouldn't dependent on the existing/current aid of foreign countries". Dhan Bahadur Bhandary, 67, resident of Salyan, Ruga V.D.C. Mugu

The farmers themselves and concerned stakeholders all collectively reflected that the food security situation in the case studies villages is at worse stage. Before 10-12 years, although produced food was not sufficient to meet the demand of the whole communities, these villages were self reliance on food either by their own production or by managing food through internal exchange. During the period of Maoist insurgency, villagers produced

enough food for themselves as well as to feed huge number of insurgents, now perceiving huge food deficits. In this sense, the real crisis of food in the remote villages is very recent phenomena. Certainly the access of quality food and balanced diet is an issue but the ever highlighted food crisis itself is created by the food aid and dependency culture.

Food dependency on external foods, particularly food aid was the very concerned issues at all level. As discussed in earlier section, food aid was not very new activity for the Karnali, Nepal Food Corporation (NFC) is providing subsidized foods since 1976. They supply rice and pulses, and salt in the district head quarters, some time they also supply these items to VDC centre. Currently they are supplying 5Kg of rice per HHs. However, villagers form distant villages do not access these subsidized rice rather influential people and local merchants buy these rice and sale to the rural people in higher price.

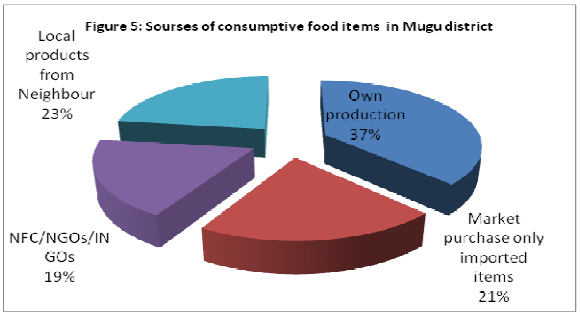
At the same time, there is heavy misuse of this subsidized rice to make local wines and then transported to rural villages. There is a guideline for food distribution from NFC. According to it each HHs receives 10 KG per/month. However, many of the local activists said that there is not following the system and there is heavy misuse. They claimed that at least 25% of the NFC subsidized rice is misused for wine production and another 25% was sold to influential people with the recommendations of political party leaders. While in discussions it was also revealed that the staffs of NFC bribe to supply the large quantities of rice to traders and local shopkeepers. According to local villagers, it is very usual that if they have to get NFC rice they need to provide some local products to the officials of NFC like; chicken, dal, honey and ghee.

Another World Food Program (WFP) is supplying rice through food for work program since 2061 in Mugu. The foods for work are supplied based on the village level planning for construction works; irrigation cannels, community buildings and schools are the major construction. These activities are organized in partnership with NGOs and local institutions. The partner organizations are responsible for the implementation and monitoring of the work and provide foods for these works. Depending on the volume of works, villagers commit to contribute certain days of labor and in return they receive the rice. The rice supplied through these means is distributed equally to the villagers and therefore, it is not enough to manage the annual food deficit by poor and marginalized communities.

Although the WFP was for meeting the food deficit needs but the way it is planned and executed do not support the claim. For example, WFP provided food for works in Khalcha village in Jima VDC last year but they did not provide such support this year. How this token support secures the foods in the village? Villagers shared that they now managing foods their own- exchange and local borrowing. Although some local food traders bring rice to local shops, very few villagers buy from these shops. Very few seldom go to Gamgadi to seek rice from NFC. The average food bought from the Gamgadi hardly meets the 10-15 days food deficit of a year. Similar case was form Dhaina VDCs of Mugu, villagers hardly bring rice from NFC or market once a year.

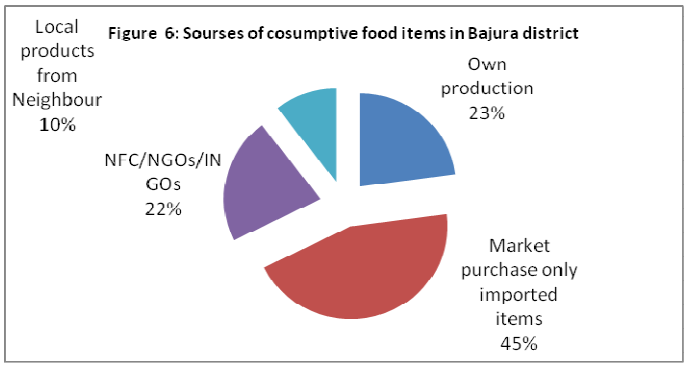
There were different cases from Bajura. In the lower part of Bajura, road is connected therefore rice and other food items are available in local market. There is little or no concerns for NFC rice in these areas. Many of the HHs members from these areas goes to India for cash and family back at home buy food items from the markets. Majority villagers feel proud if they are capable to buy and eat rice. A shop keeper at Aatichour said "in our village who cannot afford to buy rice eat maize and millets".

However, there are different stories from the nearer villages of Gamgadi. A local boy from Shreenagar, near village of Gamgadi said "My mother did not go to Ghatta for last 6 month due to the easy available of flying rice". It is true for the nearest villages of Gamgadi and for those who can afford to pay cash for food. Since very poor and marginalized groups have limited financial resources to buy and stock food for future, their strategy is mainly maintain daily foods from different sources of exchange and bartering. The primary source of food comes from the labor works within the villages, exchanging with minor products and exchanges with HHs items.



The evidences from the case study sites suggests that the imported rice hardly secure the food demand of 48-50 days (12-15% depending upon the HHs categories) rest is produced in the villages or exchanged locally.

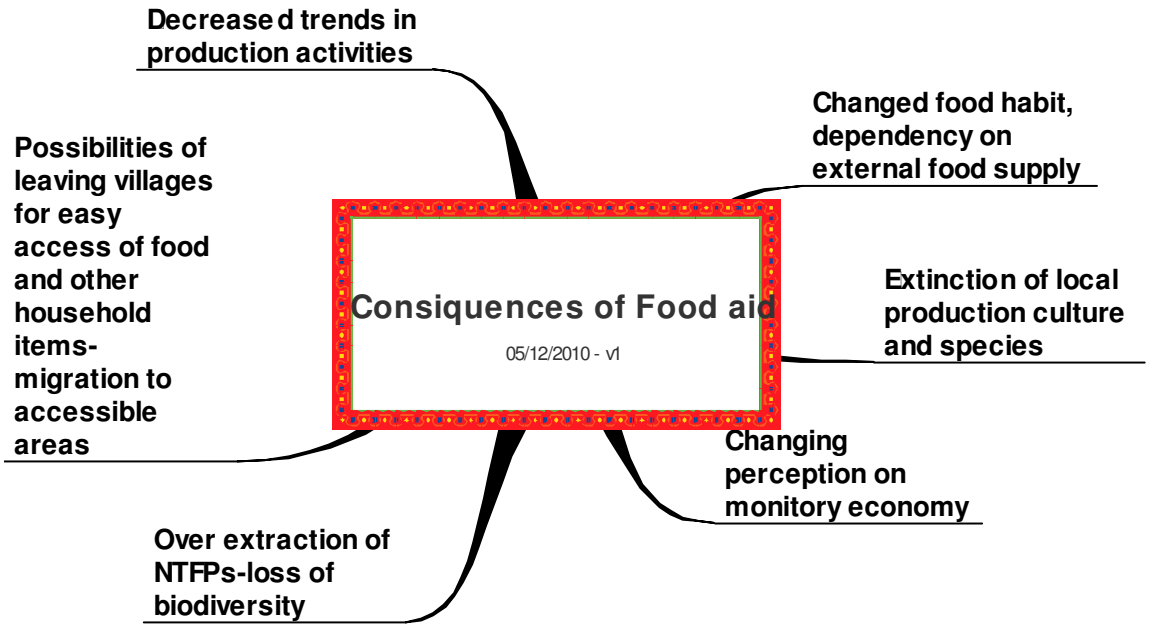
Food sufficiency from own production is about 23% and 37% of total consumption in Bajura and Mugu district respectively. Rest of the used for total consumption comes from other food sources. The exchange from neighbors, purchasing from markets, contribution by NFC and WFP, are the other sources of food items of the farmers. The detail of consumptive food items can be seen in figures 5 and 6.



Though there is high demand of rice from the villages the real import is less than projected. The distorted demands were put forwarded by the local elites with the hope that they would receive more food for work. This has caused very serious implications on local infrastructure development and communal works in many parts of the districts. The photographs itself illustrates the story. Similar situation prevails in road construction, school and community buildings and health-post and so on. The general perception on outside assistance is negative and every villager including village elites are demanding food as they see potential for misuse in many ways.

Whilst changing national as well local economy, earlier subsistence agriculture economy no more supportive to run households. Simply, income from the ordinary farm is not enough to meet the expenses at household level. This situation is pushing them out of the farming occupation for basic survival.

This is leading irreversible effect on food and agriculture production. Farming population moving into off farm activities factored by migration, change in the family structure, land holding, climate effects, technologies, markets and input facilities including agriculture loans are some prominent issues for the downfall of agriculture. The lack of political commitment and policy support in favor of food and sustainable agriculture is clearly visible at local level. The reduced public expenditure and service provisions in the agriculture sector indicate that the state either do not understand the extent of problem or simply ignoring it. Even the scenario of food insecurity is alarming in Karnali and elsewhere in Nepal but the planners, and senior government officials including donor communities are not serious.



5.2 Food culture and habits

Although various cereals are grown, the main food is rice. In general, the Maize in the hills is the second staple food. However, rice is heavily dominating food culture. Traditional local foods such as yam, potato, sweet potato, are not considered as foods. These have been replaced by the rice and other readymade snacks. It is at the level that people feel deprived if they have to take foods other than rice. This replacement was possible because of the cash flow in the household economy, particularly come from the foreign employments, wage in cash and selling their product in cash in the local market. Another reason to move 'rice' or readymade food is that there is no further processing of the foods. The diversified food consumptions in the urban and periurban areas suggests that if the local food items were processed, people would not have moved to rice culture.

Photo 5: A local girl eating bread made from millet

Photo 4: Noodles-changing food habit of locals

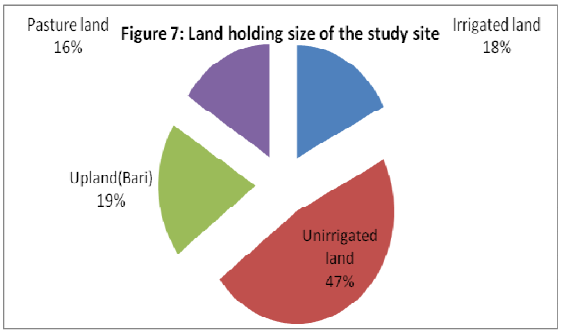
"Before 15 -20 years locally imported rice was used in festivals but now everyone is using flying rice for daily meals"- an elderly farmer from Aatichour. Case studies village [Jugada] has witnessed the similar problem; it was food secure before 10 year- deficit is caused mainly by change in food habit –from traditional foods to rice.

Change in food habit has been seen after the introduction of NFC and WFP since last 5-10 years. Flying rice is very popular among the villagers. It is taken as prestigious food among all, which is causing to change in food culture. Maize and soybean food is less popular. Maize major staple food is considered feed for mule and soybean for sheep and goat. Increasingly, valued potato chips but not potato, noodles not wheat flour, rice not the Chino and Kauno which is creating dependency on market and its monopoly with limited consumer's choice and uncontrolled price. The local produce like Chino, Kauno and Marshe was diminished in terms of area and production.

Since, there is little use of the food items other than rice, farmers are started cultivating rice everywhere. This is typically visible in Aatichour and Jugada VDCs of Bajura. Even there are no grain yields from the rice cultivation, farmers are trying hard. When asked why they are planting rice everywhere there answer was simple- it is the staple food to eat and if we could produce locally we do not have to pay for it. At the same time, farmers prefer to go for monoculture and high value crops. For them, this is efficient as well as manageable; farmers need not to bother for post harvest management and storage of diversified products, which is becoming a major challenge in the context of changing farm labor as well as family composition. For example, farmers who grow diversified food products, needs to go for multiple tasks in post harvest processing and arrange various storage facilities.

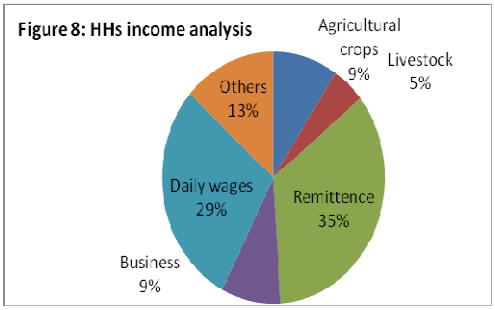
5.3 Livelihood resources

The majority farmers in the areas are copping their livelihoods with very limited land and other resources. Most of these farming populations who invest time and resources for more than six month in producing foods and actually having food secure from their product is only for limited period. Scattered piece of arable lands in the very sloppy terrain is costing farmers. Similar situations while supplying inputs and harvesting and processing of the product.



On an average, the size of the land is 9.6 ropani per HHs at the study side of the Mugu district. Only few percentage of the land is irrigated (18%) and majority of the land is un-irrigated (47%) which can be seen in the pie chart below. The pasture land covers the 16% of the total land and seems to be potentiality for livestock sector (DADO, 2066). The large area of un-irrigated and upland shows the big prospects of NTFPs in the district.

In the study site of Mugu district, highest percentage of the HHs income share is contribution by the remittance which accounts 35% of the total income of the HHs (Field survey 2067). The seasonal migration to India has been found maximum in the study site of Mugu and Bajura District. The daily wages (construction of houses and other wages) accounts second contribution factor for the total HHs income. The detail of shared of HHs income can be seen in the figure 8.



Physical infrastructures are changing rapidly such as construction of road, electricity, market links, English school and mobile phones but with limited choice of improving HHs economy. The livelihoods assets of the majority people in the case study villages are not sufficient, therefore the rural HHs are facing multiple problems of livelihoods security. They have very small land holding, livestock and other sources of income. Historically, many of the households in these villages were coping food as well as essential livelihoods support systems by various means of products and services. These are temporary migration to India, producing essential HHs items and exchanging these with neighboring villagers.

Photo 7: A source of income: knitting woolen carpet from wool of goat

From ancient time migration was one of the copping strategies of the poor and marginalised communities. The migration not only helped local

people to earn hard cash but also saved food for families remained at home. Seasonal migration to India is major source of income for the poor and marginalized, especially for Dalits. Another important livelihood resource is household items from NTFPs and traditional cloths made from local wools.

The permanent migration since 1991 has been found very few in the study area of the Mugu and Bajura district. 9 families from Bajura and 25 families from Mugu districts had been permanently migrated to different parts of the country i.e. Dhangadi, Nepalganj and Kohalpur etc.

Table 6: Migration status of the study area

Migration categories	Bajura			Mugu		
	Male	Female	Total	Male	Female	Total
Permanent migration since 1991	9 family			25 family		
Long term outmigration	34	16	50	37	12	49
Seasonal and short term outmigration	104	8	112	105	20	125
Total	138	24	162	142	32	174

Source: Field study, 2010

The buying of basic food items is the main sector for using remittance in the study sites of the farming HHs. In the study site, it was shown that, 80% and 72.5% (in Bajura and Mugu respectively) used remittance for buying different food items. Paying of loans is the second use of the remittance. Only a small proportion of remittance was used for health care, buying clothes and schooling of the children.

Table 7: Percentage of remittance used sectors

District	**Percentage Remittance used sectors**			
	Schooling of Children	Buying Foods items	Paying loans	Others activities like cloths, Health etc
Bajura	0.5%	80%	17%	2.5%
Mugu	1%	72.5%	20%	6.5%

6 Factors affecting food insecurity

Various factors are affecting the food security situation in this region. The main factors are out migration, changing agro-economy and climate change effects. In the section below, we will look the details on how these factors affecting food insecurity.

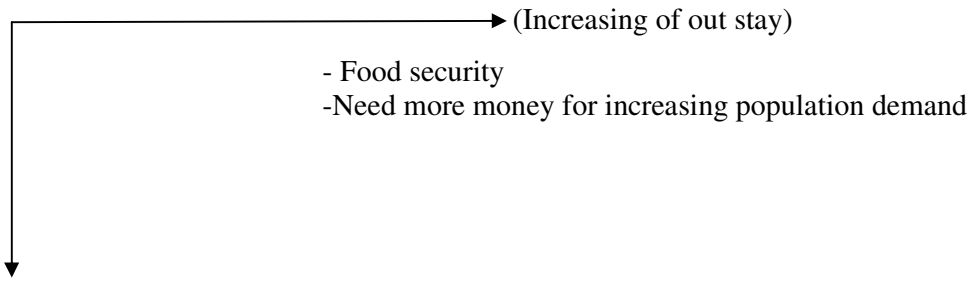
6.1 Out migration

In general, youths are moving out of the village; in search of employments, study in urban areas and aboard. Such migration is largely happening to avoid the farming occupation which is perceived as marginalized. Many of the farmers themselves are encouraging their family members to do so as their own experience of agriculture based livelihoods is not sustainable in the context of changing household economy, where cash is necessary to run the household. Generally, there are disabled, old and poor people remained in the villages who do not have confidence and resources to move out.

Farming occupation is not regarded well by people, and as a result, youths would not like to work in farming. They consider farming as (laborious, not profitable, high expectation to go for foreign or local job market in urban area and view urban lifestyle as superior. The main concern of all farmers and other people was that agriculture has suffered because of the lack of human resources to work in the agriculture field. With raised awareness and values to educations all children go to schools, where as 16-45 year old male population deserted their home and moved into urban areas and foreign lands in search of employments. At worse, agriculture is solely depends on the female members and old people. As a result, there is shortage of labor and interest in farming.

Seasonal migration to neighboring districts and India in search of employments and battering and exchange of food and other HHs items are the historical coping strategies. Earlier, males of the villages used to migrate temporarily after plantation and come back to village for harvesting. In between, they used to earn enough money for household items other than food. Increasingly, the poor and marginalized people do not get enough food around the villages; they need to have extra income to buy food as well. This situation put them in pressure to leave the village in early and back home late season so that they can make enough money to meet households financing.

Out migration destination- Traditionally, there was out migration in India in between planting and harvesting to secure livelihoods in the region. The number of out migration is in decreasing trends but the period of stay is increasing.



- Introducing of flying rice
- Food for work program/domestic labor work
- Increasing schooling of children
- Karnali employment scheme

The trends of out migration is decreasing because of the Karnali employment scheme and food for works in general and in specific, increasingly youths are enrolled in schools as well increased local destinations for domestic labor works. The increase in the out stay mainly to secure foods and other HHs demands as more and more cash income is required to meet these demands. The trend of out migration is decreasing after the WFP introduce the food for work program. The main cause of seasonal migration has been directly related with the food security for their own HHs i.e. save food and earning money which is mainly meant for buying clothes and food items.

The demands of money force males to move out, which are putting female counterparts to take more household responsibilities particularly managing their farm lands, livestock. At the same time, raised awareness on the importance of education as well as community efforts to send children to schools is also making women's life difficult. It is not bad to send all aged children to schools but when children enrolled into schools they hardly share household responsibilities. There is little or no changes in family based agriculture practices, but the family structure as well as human resource conditions are changing rapidly, which is affecting the production as well as overloading women member of the family.

6.2 Changing subsistence agro-economy

The subsistence agro-economy of the rural villages in Mugu and Bajura is changing rapidly. In general, with the increased cost of production, increased labour costs as well as costs of input and services, agriculture is no more viable option for resource poor farmers. Many of the rich and medium farmers taking agriculture as side business and poor and marginalised people without substantial resource base are in agriculture to maintain their livelihoods.

The market based economy pushing rural communities to go for cash income to maintain their HHs economy. As discussed elsewhere, the young generations do not see their future in agriculture with the high demand of cash in every aspect of their livelihoods.

Both in Bajura and Mugu, Subsistence type of agricultural practices was seen with traditional type of farming. For example it has been observed that the use of compost after the plantation of wheat seed. Similarly, the importance of vegetables and its contribution on food security has been seen minimum. There is no kitchen garden is prepared for HHs vegetable consumption. Among others, kitchen garden and toilets are the least practised household activities in the case study sites.

There are similarities in the main agricultural crops; rice, wheat, chino, kauno, millet, maize, potato, beans, soybean etc. Generally only two crops are planted on a year. The cropping calendar is as follows: paddy-wheat, millet- wheat, Chino/Kauno-wheat- beans + maize. According to the villagers, intercropping of beans with maize and soybeans with kauno is the best practice. Non cereal crop production contributes 4.75% and 6.66% in Bajura and Mugu respectively of the total production of the main crops (see annex 5). The district wise

consumption preference ranking of different food items can be seen in table 8. In both of the districts, rice is the first priority cereal crop for their consumption preference ranking. Maize is the least prioritize cereal in both of the VDCs.

Table 8 . Consumption preference ranking of food commodities and district

Commodity	District wise consumption ranking	
	Bajura	Mugu
Rice	I	I
Finger millet	II	V
Wheat	III	II
Maize	IV	VI
Potato	V	VII
Barley	VI	VIII
Amaranthus	VII	
Chino		III
Kauno		IV

However, they put least priority on maize crop and it is only used for bread and animal feed. If we can replace area cultivated millet crop (mainly use for alcohol) by maize crop, the food insecurity problem is suddenly decreases.

In Mugu, only 5.2% land is arable and out of 5.2% arable land, only 6% is irrigated land. Similarly in Bajura, 9.2% land is agricultural land (1.37% irrigated and 7.83% is the unirrigated land in total area). Forest land and pasture land covers the large area i.e. 39% and 16% respectively (DADO, 2066). This figure indicated that this small percentage of irrigated land cannot afford the require amount of food for the total population of the district i.e. 55708 in Mugu and 108781 in Bajura district. In other sites, 30.5 %, 32.9 % and 25.7 % land is covered by forest and upland and pasture land respectively. This indicated that cultivation of NTFPs and perennial trees (livestock sector) will mitigate the food insecurity problem of the district.

Another, there are replacements of the traditional crop types rapidly. In Bajura, millet and Marshe and in Mugu chino and Kauno are being replaced. These are the most staple local foods of the region. Replacement of these local food species (amaranthus, chino, kauno) caused by imported rice as well as the increased disease and pest (millet and marshe).

According to local people, it was 15 years back Bajura and Mugu were producing enough food for the district. Although the food production is in decreasing trends in both the districts, Bajura is more severe dependent than Mugu. The food sufficiency index of the studied VDCs of the Mugu is 0.38 which is significantly higher than the studied VDCs of the Bajura district i.e. 0.28. The detail of food sufficiency of the district is attached in case study part (Annex 5) According to the data received from DADO office, only 8 % improved seed is used by the district and rest 92% is covered by local seed. This is one of the causes of low productivity of the district. The seed replacement ratio (SRR) is also very poor and due to this, productivity trend is decreasing. For example, the blast disease is seen in millet crop which is caused by long time of inbreeding problem. There is also the problem of extinct of locally adaptive varieties, especially of paddy varieties such as Thapachini and Jado.

General perception on sharing seeds and milk products are negative in the sense that traditionally local people believe that if the seed and daily products sold or shared with other fellow members – they will lose the productivity [saha] in their own farm. Although there is seed sharing with close relatives usually they do not share within the village. This perception is hindering potential exchange of seeds as well as marketing of milk products. There is also limited access to knowledge and skills on seed selection techniques too. There is very limited innovation, research on crop species that can be grown in the area.

Saving of the seeds up to the cropping seasons is also challenging for poor and marginalized farmers. Usually they run out food grains before next cropping season therefore stored seeds are used for food. For them copping with the immediate hunger is more important than seeding in next season. At the same time, they seem to be lees aware about importance of seed on productivity of crop. It is observed that there is no or limited selection of grains for seeds.

There are limited inputs and services from concerned authorities. The extension services to the villages are heavily affected during the conflict and these are not at places now as well, partly ignored by the officials and partly reduced such services by government policies. Local viable production as well as processing technologies and knowledge based on agro ecological and local cultural practices are less recognized by the specialists. A very good example, we observed in Khalcha where local farmers have developed and used apple storing technology

where apples can be stored for more than 9 moths safely. All the materials are locally available and technology is very simple to adopt.

Another very important issue is access to market and marketing the products. As this area is remote and isolated, the exchange or marketing of agriculture products is very difficult. Generally market based production; except for some low volume high value, product is discouraging because of the unavailability of transportation and marketing. In the last season farmers of Dhaina produced enough cucumber, pumpkin and radish in their farms. Similar was the case in Khalcha, farmer's cooperative of 52 HHs was able to produce more than 100 quintal of apple. But these farmers felt sorry for not being able to sale or exchange these products.

Although the local production of such foods certainly improved nutrient uptake as well as save the food grain consumption. The food consumptive pattern of the studied area of the farming HHs can be seen in the table 9. The table shows that cereal crops like rice, wheat, maize, kauno, chino, millet are the principal consumptive sources as compared to non cereal items like vegetable and other sources. On an average, 11.46 and 11.2 months, Bajureli and Mugeli consumed cereal crops respectively. This figure illustrated that they give top priority on cereals crops and least priority on non cereal food items.

Table no 9. Food consumption ratio on the basis of cereal and non-cereal food items

District	Food consumption pattern in months around year	
	cereals	Non-cereals
Bajura	11.46(95.25)	0.54(4.75)
Mugu	11.2(93.34)	0.80(6.66)

Sources: Field study, 2010

The local farm products have little monitory value, in comparison with exotic products. Such devaluation imbalanced the tradeoff between these products and discourage farmers to enhance the production of such item unless they aware on nutritional values as well as technologies for processing and storage.

The agriculture products such as cash crops, grains, beans and vegetables are sold at the harvesting season and re-purchased food items from the same market during off season. This

is partly conditioned by the farmers' economic position. Their daily economic transactions depend mainly on agriculture products, the formal/informal loans, investment in inputs and household finance are made through selling the agriculture products during harvesting season.

However, there is decreasing services and facilities to the farmers. At present there is very limited or no agriculture services available in the villages. Earlier there used to be extension workers in the villages conducting some demonstrative as well as capacity building activities in the farmer's field. However these days, there is no such activities carried out, expect in some project areas run by development projects, if their activities are related to the food and agriculture.

Majorities of resource poor farmers, who have no other choice for their livelihoods, they are forced to continue the production activities though it is not profitable at all. Many of these poor farmers lack enough lands for their subsistence; they either go for share cropping or for leasing. However, these days there is increasing trends of keeping lands fellow as there is no any strict rules and regulations to reinforce cultivation in agriculture lands. Some land lords claim that share cropper or the lease holders do not care about maintaining quality of soil. They tend to put chemicals as much as possible and get harvests for short run. Also, the price of land has increased and it has made difficult for the poor to buy or hire the cultivating land, this is especially so near the market.

The good thing is that there is no use of chemical fertilizers and pesticides in Mugu except some individual farmers used it for experiment. However, in Bajura, many villagers tried to use it and still using it. However, their experiences but growing realization of harmfulness of these chemicals- soil degradation [hardness]. However, the soil fertility is decreasing day by day. There is continues destruction and Degradation of forestlands which is lowering the soil fertility and water sources. There is no natural replenishment as well as necessary arrangements of organic substance to top up nutrients into the soil which is causing imbalance in nutrient composition into the soil. However, there is no use of chemical fertilizers and pesticides, which is good for the health of soil as well as human being.

In aggregate, the following factors are contributing the declining agro-economy of the region;

- Lack of ownership of lands, increased cost of land hire and leasing.
- Changing family structure, household economy, labour force availability.
- Change in climate, seasons and forest-agriculture landscape i.e. increasing trends of droughts
- Lack of technical services and inputs including finances to improve agriculture
- No individual/collective effort to secure seeds, foods and soil fertility.
- Unavailability of labour force, costly to use wage labour, migrated family members
- Lack of markets and transportation facilities

6.3 Climate change effects: growing uncertainty

Climate change effects are apparently visible to farmers. Most noted is the change in rainfall cycle, temperature and other micro climate. The change in rainfall cycle is being noticed since 15 years in different case study sites. Given the geographical variations, the causes and effects of such changes vary greatly. In the settlements at high altitudes have also noticed that there is drastic reduction of water recharge during the monsoon. According to villagers, from last 5-6 years there is no full recharge into the soil, they claim that since there is very less but short rainfall, which run off quickly, therefore there are few springs seen after the rainy season.

Photo 8: Barren land at Jima VDC since 15/16 years due to reduced water sources

Farmers of Dhaina and Jima shared that there was enough snow that continuously discharged spring in the area now a days it is completely dried and there is no water for drinking as well. This situation is forcing farmers to move North Slope of the hills and desert south front. The changing land use patterns causing high level of deforestation as well as shrinking the arable lands in the village.

Climate change is impacting directly in food and agriculture system. The most prominent impact is lowering snowfall/rainfall and increased drought. In local term khaderi (drought) is the most serious problem in agriculture production. Although, everyone is aware on the changing trends of snowfalls/ rainfalls but there is little awareness on the causes of such changes therefore are slow in adapting there agriculture. Rather there are demands for

irrigation cannels, with the hope their agriculture would survive with the regularity in water sources.

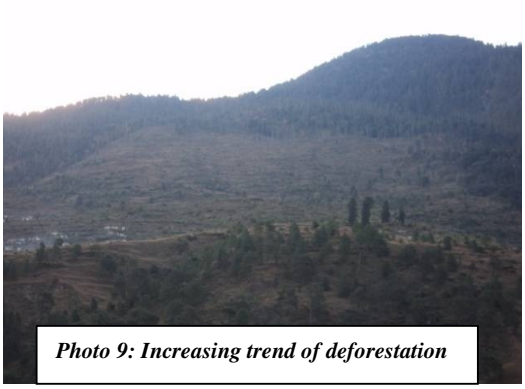


Photo 9: Increasing trend of deforestation

However, the changing patterns in rainfalls/snowfalls have dramatically affecting the traditional cropping technologies as well as whole agriculture system. Farmer's have slowly developing resilience over these changes and started adapting agriculture accordingly. The changing pattern of manure application in Dania is an example of this kind. While in discussion, many farmers realized that we [human being] cannot fight with the nature therefore have to adapt as nature changes.

For example, while there was heavy snowfall during winter, they used to apply manure after sowing the seeds of wheat on the top of soil, which was decomposed after heavy snow on top of it. But these days there is little or no snow falls or retain into ground leaving manure applied into ground decomposed. Realizing the problem in adapting technologies CEAD in Dhaina-Mugu is experimenting to apply manure before seeding, which has increased the productivity of Wheat by 25% in demonstration plots.

7 Scope of securing food in Karnali

However, there are not only the problems in agriculture in Karnali. It also has potentials and opportunities. Potentially, the productive land resources still not damaged so far, farmers are practicing the agriculture, livestock management, agroforestry, organic pesticides that are helpful to reclaim the soil fertility, production and productivity in a sustainable manner. At the same time many are receptive for new ideas as their experience with the current agriculture practice is negative.

Farmer's experiences and the extent of problems of modern agriculture as they are facing today give an opportunity to explore the potentials of other alternative practices. At the same time, there are mosaics of sustainable agriculture practices all over the places but are scattered and isolated, needs to bring into wider social connectivity so that these will have greater demonstrative effects.

In some cases, some farmers are trying to apply alternative approaches to address the recurrent problems. These are primarily related with innovations an adaptation of organic farming solutions; increased use of organic manures such as compost, cow/buffalo dong, green manures, use of urine, herbals for insect pest control and collection and storage of good quality seeds from own as well as other neighboring farmers.

In a way of developed understanding of the food and agriculture in the region from the literature review, interactions with concerned stakeholders and field observation, it can be said that there is possibility of securing food through production system management. But the precondition is that a very high level of commitment and renewed efforts are required. Primarily, the ongoing quick fix approach of flying rice from outside must be reviewed in line with the approach to revive the farming in Karnali. There must be very genuine efforts to retain farming communities as elsewhere in Nepal, farming is getting less and less attention and farmers are moving out from the agriculture. In specific, youths are not interested in farm works and farming. They are looking for alternative to agriculture occupation. At the same time, traditional subsistence agriculture has no attraction as well as it is not adapting in new changing socio-economic and changed climate scenario. Farmer's friendly, adaptive agriculture technology, institutions and policies should be in place.

The field observation provides encouraging portraits on the potentials of natural resource capital of the region. Some of the areas that can likely be developed are as follows:

- There is high potential of NTFPs and livestock promotion in the region. For example, in Mugu the 35% upland will be successfully cultivated by the NTFPs like attis, uttis, panchaaule, chirityo, guthichau, katujadi, samjadi, satuwa etc and this is one of the best strategies for struggling with food insecurity of the district. Similarly, Livestock sector like rearing of goat, hill goat and sheep will be big prospect as pasture land covered larger area i.e. 25.7 %. Fruit crop like apple, peach, walnut and olive will be big potential for future as demand of organic product are increasing day by day in the national and international market. High value low volume vegetable seed like rayo, radish and carrot can be successfully cultivated in natural environment which seems to be more beneficial as transportation cost is low. The indigenous crop like chino, kauno, marshe have big potential for exportable commodities.

- The farming system is organic as inputs from outside have not reached there yet. In the other hand, it is necessary that local food production needs to be augmented along with the efforts to make it accessible to the poor and marginalized people. Instead of supplying food from outside using expensive transportation facilities, it is necessary to increase food production locally and this food would become cheap for people to buy. More on what can be done to increase food production needs to be studied in detail through empirical information/data at local level.

- In all case study sites, adult farmers have their own lifelong experiences on how the agriculture is changing over time. Memories on traditional farming practices where wood and food were produced together within the interface between farm and forest in a sustainable manner, diversified food culture and cooperative arrangements [parma] in farm management in particular were recalled while in group discussions. People believe that such arrangements can be reinvigorated adapting the emerging socio-economic realities. This can be demonstrated by 'can do' attitudes of the political leaderships and encouragements through wider recognition of the farming communities as respectable citizens.

There are many constraints while promoting sustainable agriculture. Firstly, there are doubts whether farmers will get the level of yields as they are getting today. It is very important them to produce the volume of food grains to feed the family. Secondly, there is lack of technologies and appropriate services to promote SA in the areas. Many of the farmers expressed their unawareness about the possible alternative to soil fertility, disease and pest control and hybrid seed; however, some farmers are using the alternatives in same locations. It suggests that we need to put efforts for both; to help them to learn from each others as well as technical support for knowledge and skill development.

Similarly, there is potential to use common lands and marginal forest lands for food production. Use of common land and forest land not only increase the productivity of the resources, but also institutionalize the collective farming culture and conservation based economy in long run. The promotion of NTFPs in leaseholds and community forestry are some good examples.

Also these are the potential areas to begin with promoting low input agriculture. There is opportunity to promote alternative (low input, organic) agriculture, increase food security through food diversity but need very live engagement through demonstration at field level. The field observation suggests that in all case study sites there is potentials for promoting sustainable agriculture though are at different stages and diversified scope of product promotion.

Based on the field observation as well as discussion with concerned line agencies, local government and CSOs, the potential of the area in boosting agriculture production and productivity can be summarized as:

1. There is potential to increase food grain production through farming, processing and enriched with research and extension services;
    - High potential of Maize [instead of millet or mix cropping] and potato cultivation in case study sites of Bajura and Mugu. However needs extensive research and extension services to promote the locally suitable verities
    - Diversity in food item [maize and potato] and processing for optimum utilization of available foods[fruits and vegetables]
    - High value crop production-especially vegetable seeds [cross pollinated],livestock, honey, temperate fruits and cash crops such onion garlic and ground nuts

2. In each case study sites, there are organic agriculture practices in place. In case of Bajura and Mugu there is high potential of promoting organic seed production as well as organic orchids of apple, pear and plum –however attention should be given to discourage the practice of using chemicals has started recently, especially in road areas of Bajura.

3. There is decline of manure production by the result of scarcity of grazing fields as well as labour force at household level for livestock raising- need to develop plans for promoting organic manure production locally.

4. As a missed opportunity, the resource poor farmers are not getting much income from traditional farming itself, and they are also in the state of food deficit to a large extent,

therefore they will have no hesitancy in converting to organic farming for the market provided it is guaranteed.

8 Conclusion and way forward

The field study reports that there is the erosion of natural as well as social capitals and that has led to food insecurity and other livelihoods problems in the region. Seasonal as well as temporary migration, low level of services and inputs and climate change effects are main cause of decreasing production and productivity.

This brief context mapping exercise explored the major issues and challenges of food and agriculture in the region, but still need to deepen as well as widen the horizon of understanding of these issues. Some of the potential areas those must be explored further are: migration and its impact in food and agriculture, feminization of agriculture works, changing rural socio-economy at HHs level, indigenous food and agriculture practices and scope for adaptation and climate change effects.

Another, the roots of food insecurity problem lie in both structural as well as operational level. Therefore handling food insecurity demands actions addressing both issues. The response to deal with the current problems are short sighted and do not address the problem that local livelihoods facing today. In some areas of mid western regions, food is being supplied from outside for more than 3 decades. The quick-fix approach of supplying the food from outside and its continuation for a long time has not solved the food crisis in the region. It has rather aggravated many problems. The livelihoods in these places were so vulnerable and precarious that the problem of food insecurity continues to occur.

At present, all policy and practices in Nepal are guided by the concept of food security. As a result, the priority to local food production has not been given. The regional autonomy and right to maintain their local food production should have been promoted by the State. For example, this would have been a good solution to Karnali's food problem. On the other hand, the State is encouraging further deterioration in local food production. At present, government has not been able to fulfill the rights of people to food. Therefore, food security is important immediately. Government needs to feed people suffering from food insecurity. Therefore, it is suggested that both the concept of 'food security' and 'food sovereignty'

should be adopted for the short term. But in the long term, food security needs to be provided by 'food sovereignty'. Accordingly, government needs to start the process of food sovereignty by investing on locally sustainable agricultural system.

- Access to land and natural resources for a large majority of poor and landless farmers (i.e., who actually cultivate land) is important if production is to be increased. This can be done through land reform program. This should also taken other problem in agriculture like land fragmentation and lack of ownership/access to land for women. While there are debates about the modalities of land reform within Nepal, the basic principle should be that the real cultivators have incentive to produce more and they should also get a major of part of the food produce. At present, the land tenure pattern is such that a majority of farmers who cultivate others land get only half the produce even after shouldering all cost incurred in production process. There could be some difference here and there, but this is the general pattern all over the country. Therefore, tenant cultivators do not have real incentive to produce more.

At present, there is a critical need to support the most vulnerable people. For this following steps need to be taken;

- Identify the identity, location and situation of most vulnerable people. These need to be supported through food distribution programs; cash transfer schemes, various feeding programs and employment schemes. But these programs and schemes are oriented at developing infrastructures (eg irrigation, terracing, developing bio-gas plant, buying animals and the like) for sustainable farming in future. These must be focused in enhancing production and productivity rather unplanned infrastructure development at community level.
- Developing productive safety nets like subsidy in materials required for sustainable farming and community insurance program or group farming and marketing schemes.
- Special programs aimed at women – helping the poor and vulnerable women to buy local fresh food instead of transferring food from international market.
- Support for local agro-based industries and distant marketing through co-operatives.
- Awareness raising about the importance of local food.

- Conservation of local bio-diversity and local seeds. Improvement through selection breeding needs to be prioritized.
- More research in minor foods especially suitable in marginal areas.
- Programs aiming at improving the food availability through food aid need to match the food aid with improving local production. Otherwise, the dependency on food aid seems to grow.

In these areas, agricultural interventions in terms of agronomic practices that increase production are to be researched and disseminated. As these areas are marginal, but they have the potentials to produce locally suitable crops like different varieties of traditional crops (like different types of millets like finger millet, *chino, kauno*, and other uncultivated food). But there is not much of knowledge generation on improving the production of such crops. Research is needed in these areas.

The emphasis is to identify the local crops that grow in the marginal environment (dryness, slopes etc) and to improve their productivity. Similarly, production of nutritionally important crops like vegetables and fruits is important. In the areas where there is high level of food crisis and malnutrition, there is also no tendency of producing and consuming vegetables. This also requires development of an advocacy document that notes the cost of poor nutrition to agricultural productivity, and highlights the national cost of policies that worsen the nutrition situation.

Similarly, the contribution of own production to total food security is low as many households do not have sufficient land for the production of food. Improvement of production through improved and environmentally friendly techniques could certainly help in increasing production at the household level which is considered as most reliable and healthy food.

Food security and nutritional status can be increased through production of nutritious crops at the household level. Vegetables, fruit and milk can be produced at majority households in the region, even though all of them cannot produce all staple food (mainly cereals) they require. Therefore, production programs should give emphasis on these crops and animals that are important for the vital nutrients. If local production of these things can be augmented, the landless people could also get access to these through exchange with labor or through purchase.

Similarly, given the impact of climate change on production, research on how to take benefit of climate change and how to adapt to it are important. Research institutions need to be proactive in this regard. While government institutions like NARC (Nepal Agricultural Research Council) is doing some research, but this is clearly insufficient to meet future challenges. More resources are to be allocated for this purpose.

Finally coordination among the concerned stakeholder who are responsible in providing inputs and services, lobbying and advocacy for the food and agriculture rights is crucial for the constructive dialogue and discussions to improve the policy and its implementation.

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10 Annexes

10.1 Study plan and activities

Number of days	Proposed activities	Remarks
3 days	The team will collect and review relevant documents/reports related to the initiative and the	researchers and a research assistant will be involved to

	district; meet with RtF Network and relevant CARE staff in Kathmandu office, and prepare a detailed work plan.	carry out this activity
2 days	Finalize work plan, in consultation with RtF Network and CARE, including the identification of most appropriate tools including UCPA.	researcher and research assistant
1 day	Fly to Nepalgunj	researcher and research assistant
3 days	Fly to Bajura, Humla and Mugu (districts to be finalized)	researcher and research assistant
12 days	Prior Information collection from various groups/individuals/line agencies /RtF network members/key informants.	Research assistant and local partners will involve in prior collection of information [2 days each VDCs and 2 days in each district]
20 days	Carry out field research in selected 4 VDCs and consultation with district level stakeholders	researcher and research assistant in carrying research work [4 days in VDCs and 2 days each in districts]
4 days	Return from district to Nepalgunj/Kathmandu	researchers and research assistant
8 days	Analyze data and prepare draft report. Submit draft study report to CARE-Nepal.	researchers and research assistant
	Review of draft report by CARE	
1 day	Study Team receives comments on draft report in a brief interactive session, which constitutes of a presentation by the Team and feedback from CARE Nepal and RtF Network secretariat and other INGOs.	researcher
2 days	The Consultant incorporates feedback and submits the final report to CARE Nepal and Rt Food Network secretariat by end of November 2010.	researcher
Note: 53 days of research assistant and 44 days of researcher.		

10.2 Detailed questionnaires

Details information collected from VDCs

General Information	
Information/Indicators	**Methods**
Disaggregated population data by age sex and cast/ ethnicity	Secondary information from DDCs/VDCs Profile/key informants survey

Resource map on land use; like area under farms, forest, pasture, other non cultivated land and its type and areas	Secondary information from DDCs/VDCs /DADOs Profiles/Reports/Questionnaire method
Land distribution; Land Holdings, land distribution, Land less households, land tenure patterns (renting etc)	Secondary information from DDCs/VDCs /DADOs Profiles/Reports/Questionnaire method
Social Structure	
Wellbeing ranking: Wealth condition and distribution, different caste and indigenous groups and their population and ownership of land and other resources, Dalit population (including bonded and semi-bonded labors also) and their ownership of land and other resources, Women's condition and their socio-economic condition	Participatory Rural Appraisal, Group discussions, Secondary information, Questionnaire
Social institutions; Social groups/ community groups and management of common resources like forest, water, pasture and the like(community forestry, users groups, informal groups, co-operatives etc) **Analysis of who are involved and what roles they have, What benefits they get, present conflicts in the distribution of benefits.**	Group discussions, Key informant survey,
Agricultural Practices	
Crop Production patterns, Crop cycles	DADOs Report/PRA tools like cropping pattern and Seasonal Calendar
Use of Inputs like Chemical Fertilizers and Pesticides, trends of using the new chemicals, its impacts observed by the farmers, (on Soil, water and People's health), What people feel about its impact, incidences, how man and women see the balance in the advantages and	Questionnaire methods and Group discussions.

disadvantages in the use of chemical inputs.	
Women, children's role in agriculture; how the migration, employments affecting their role in agriculture, food security.	Questionnaire methods and Group discussions
Numbers of farmers using the chemical inputs and their wealth status, land ownership and caste or indigenous/ethnic groups.	Questionnaire methods and Group discussions
Has there been an effort to seek alternatives to the chemical farming, who are involved, what have been their experiences.(Includes the lists of farmers with whom we will have details interviews during field visit)	Questionnaire method and Group discussions
Livestock and poultry production, what types, how much, general production and productivity of animals, income from livestock, problem associated with livestock like pasture, diseases, vet services, market	Questionnaire method and Group discussions
Cottage, village and households industries/enterprises- number, types employment opportunities	Group discussions and key informant survey
Total HHs adopting organic agriculture: use of technology, nutrients replenishment, pest control, use of seeds.	Questionnaire method, key informant survey and Group discussions
Food Security	
Food situation in the area, average deficit, how it is covered, what type of food imported from where, trends of food deficit, what are the activities of reducing food deficit.	Questionnaire method, key informant survey and Group discussions
What is the dependence of people on forest and pastures (i.e. non-cultivated lands) for food security, i.e. obtaining food of different types? What type of food they obtain?	key informants survey and Group discussions

What is the consumption priority in terms of basic staples (like whether people like rice or maize or what; whether people consume non-cultivated forest food). Annual ratio of the staple and other food consumption.	Questionnaire method
What is the overall situation regarding food production and its sufficiency? Is food brought from outside? If yes, what type of food and how much? Is there any way to produce more food locally and replace the importation of food? If this is so, what food could be produced in more quantity?	Group discussions and Questionnaire method
Migration and livelihood, and its impact on farming	
How many people or % of population goes outside the vdc, district and foreign countries for work? Where do they go in foreign countries for work? What they do there? Are farmers have also gone out for the work?	Group discussions and Questionnaire method
What income they send back where these income sources are utilized (Schooling of children or paying loans? Investment on farming?	Questionnaire method
Overall impact on farming and its long-term impact, other Social and political implications of migrations(Leadership, Social cohesion, Social problems and the like)	Group discussions
Market situation and marketing process	
Where do they buy chemical inputs like Chemical Fertilizers, Pesticides, Other Seeds and seedlings materials foods items like rice, maize, wheat flour, Salt, cloths, sugar etc? Have	Questionnaires method and Group discussions.

they sell their own produced products like livestock, poultry, Agricultural product and their other home made products? If yes Where do they sell them? Distance of markets form their area.	
From whom do they buy foods and others items .i.e. governmental organizations/INGOs/NGOs or from Private Businessman and difference of price from different agencies.	Questionnaires method and Group discussions.
Captured the trends of agri-based lifestyles? Overall perception on food and agriculture Increased trends of rice dependent culture Development /regional disparity/ caste/ethnicity/gender biases Future of rural livelihoods and sustainable agriculture	Discussion meeting with partners, district stakeholders and other

Detail Checklist on information collection

VDC……. **Ward ……**

District…….

General and Social Information

1. How many people eat from the same cooking pot in your household?	Male	Female	Total
2. How many of the above?			
Children (under 16)			
Elders (above 60)			
Working age (16-60) Not disable			
Working age disable			
3. Ethnicity/Caste of the		Bramin/Chhetri/Janajati/Dalit/Others	

household?						
4. What is the total area of land? In ropani						
Type of land	Owned land	Total used land	Renting in land	Renting out land	Sharing in	Sharing out
Low land						
Upland						
Pasture land						
Forest						
Total						
5. Your income from different Sectors in a years? In Amount						
Agricultural Crops	Livestocks	Remittance	Business	Regular employment	Daily wages	
6. Gender of the head of the household?						
7. What is the role of Women in your household and community decision making process? Like representation in community organizations , Participation in social meetings and management of common resources, etc						
8. How many Social/ community organizations are there?		Community forestry users groups	Co-operatives/ Community organizations	Farmers Groups	Informal Groups	

9. Who represent s in this organization from your households? Male or female and what is the role of representing person?				

Agricultural Practices

1. Could you say the crop growing schedule you have followed in this year?	Rice-Wheat-Maize Rice-Wheat- fallow Maize- Barley /Buckwheat - fallow Maize- Barley/Buckwheat/wheat-Vegetables Others

2.The seasonal calendar of farming [changes in calendar if any for last 20 years]

Agricultural commodity	Activities in Baishakh	Jestha	Ashad	Shawan	Bhadra	Ashoj	Kartik	Mansir	Paush	Marga	Falgun	Chaitra
Paddy												
Maize												
Wheat												
Potato												
Buckwheat												
Barley												
Vegetables												
Others												

3. Have you used the chemical fertilizer and pesticide? Yes or no	

4. If yes, how long has been it used for? In years				
5. How much amount of chemical fertilizers and Pesticides did you use in different years?		Chemical Fertilizers in kg	Chemical Pesticides in ml or gram	
2066				
2065				
2064				
2063				
2062				
6. Mention the main market/place Where you buy this Chemical Fertilizers and Pesticides. **Rank the mostly buying three markets.**		1.Market with in VDC 2. Market in different VDC in district or neighboring district 3. Market in DHQ 4. Others specify	1. 2. 3. 4. 5.	
7. Could you tell the differences in price in different markets?				
Chemical fertilizers	Market with in VDC	Market in different VDC in district or neighboring district	3. Market in DHQ	4. Others
DAP NRs/kg				
Urea NRs/kg				
Potash NRs/kg				
Pesticides NRs/ml or gram				
Distance of market from households in Km				
8. How many farmers are using				

chemical inputs in your community?		
9. Could you share yours feeling about chemical fertilizers and pesticides impacts? Impacts on soil, water, and people's health		
	Advantages of Chemical fertilizers and pesticides	Disadvantages of Chemical fertilizers and pesticides
In Men views		
In Women views		

10. Do you sell agricultural products? If yes, have you faced any problems during the past 12 months?

Possible problems

Possible problems	**Tick**	**Rank**
1. Poor production		
2. Weak demand		
3. Low price		
4. Poor information on price		
5. Lack to transport to product		
6.Lack of processing technology		
7. Lack of storage		
8. Others Specify		

11. Mention the main market/place Where you sell your products? Rank the mostly selling three markets.	1.Market with in VDC 2. Market in different VDC in district or neighboring district 3. Market in DHQ 4. Others specify	1. 2. 3. 4. 5.

12. Could you say the differences in price in different markets? Price at last visit. And mention distance of market.

Food items	Market with in VDC	Market in different VDC in district or neighboring district	3. Market in DHQ	4.To Neighbor	5.Others Specify
Paddy NRs/kg					
Maize NRs/kg					
Wheat NRs/kg					
Buckwheat NRs/kg					
Barley NRs/kg					
Goats NRs/number					
Sheep NRs/number					
Chicken NRs/number					
Ducks NRs/number					
MilksNRs/lit					
GheeNRs/kg					
HoneyNRs/kg					
Others forest product specify					

Distance of market in km					

13. Has there any effort to seek alternatives to the chemical farming? And who are involved? Lists such type of farmers and share your views on it		
14. How many farmers are in your village adopting organic agriculture?		
15. Do you know about the organic agricultural Principles?		
16. How to manage the nutrients in the field?		
17. How to control the insects and pest in your field?		
18. From where have you brought the seeds and seedlings materials?		
19. Have you reared any livestock/Poultry?		
Types of livestock/ Poultry	Numbers	Production
Goats		
Sheep		
Cows (Production milk)		
Buffaloes(milk Production)		
Yaks		
Chickens		

pigeon		
Ducks		
Others if any		

20. What are the major problems associated with Livestock's? Ranks according to the farmers feeling.	
1. Lack of pasture land	
2. Diseases problems	
3. Lack of vet services	
4. Low price of the Products	
5. Lack of markets	
6. Lack of Scientific knowledge to rear livestock	

21. Could you say numbers and types of cottage, village and household industries/enterprises and employed population in your village?		
Types	Numbers of industries	Employed population

22. What were the roles of women and Children in Agriculture before migration?	1. Rearing Livestock 2.Cultivations 3. Harvesting 4. Intercultural operations 5…….
23. Could you find any difference in the role of Women and Children's in Agriculture after migration for work from your community or family?	

Food Security

1. Number of months that your households has sufficient food grain supply from own production in a normal year?	
2. Could you say in which year have you	

faced more food deficit problems? In last 5 years.	
3. Does your household face problems in accessing sufficient amount of food?	Yes or No
4. If yes what are the major problems?	
Distance to market	
Insufficient cash to purchase food	
Cost of getting to market	
Food prices too high	
Others	

5. Recalling over the past year, for your household food consumption needs approx. how much food do you get from? In Percentage up to 100% or

Own production	Market Purchase	NFC	NGOs/INGOs	Gifts

6. Mention the main market/place where you buy the food items? And price differences? Last time buying price. Also mention the distance of market from house.

Food items	Market within VDC	Market in different VDC in district or neighboring district	3. Market in DHQ	4. From Neighbor	5.Others Specify
Coarse rice NRs/kg					
Fine rice NRs/kg					
Wheat flour NRs/kg					
Maize NRs/kg					

Buckwheat NRs/kg					
Barley NRs/kg					
Potato NRs/kg					
Others NRs/kg					
Distance of market from house in km					

7. How have you solved the food deficit problems? What are the activities of reducing food deficit?	1.taking loan 2. Taking food in Credit 3.Having forest products from forest 4. Having low quality food 5.Having only one time food in a day 7.others Specify
8. Is there any way to produce more food locally and replace the importation of food? Both farmers and researchers views	
9. If this is so, what food could be Produced in more quantity?	

10. What is the consumption	Ranking	Where have been	How much

priority in terms of basic staples foods and others items?	(1,2,3,4,5…..	these items imported/ brought?	amounts have you bought?
Rice			
Maize			
Wheat			
Barley			
Millets			
Potato			
Buckwheat			
Others like non cultivated forest food. Also list the Forest products			

Migration and livelihood, and its impact on farming

1. Could you say how many people go outside for work from your community? In numbers in different regions and countries.		
District	Others parts of the country	India and Foreign countries
2. Where do they go in foreign countries for work? List the countries name.		
3. Could you say, what do they do in foreign county? List the job they have been doing in foreign countries.	1.Labour in construction works 2. Household Works 3. Restaurants and Bar 4. Office works 5. Others	

4. How much amount of money have they sent for home? And in which activities are they spend money? Tentative amount and percentage				
Schooling of Children	Buying Foods items	Paying loans	Investment on farming	Others activities list in discussions

5. What are the roles of migration for work on food Security? List asking to participants and yours views.				
6. List the overall impact of migration on farming and its long term impact.	1.Increased fallow land 2.Decreased fallow land 3.Inreased food production 4.Decreased food production 5.(what in livestock and poultry farming} 6.			
7. List the other social and political implications of migrations such as leadership, social cohesion, social problems and the like others.				

10.3 Time schedule

Visited place: Bajura district Date(s): 28 August-11 September, 2010	Visited by: Dr. Krishna Paudel and Indra Sharma Dhungana

Purpose of the visit: To document the food security status of the Aatichour and Jugada VDCs of the Bajura district.

Date	Activities
28 August 2010	Departed for Dhangadi and reached Silgadi, Doti

29 August. 2010	Silgadi to Safebagar and then Pandusen
30 August. 2010	Aatichour
31 August. 2010	Aatichour
1 Sept 2010	Aatichour
2 Sept 2010	Jugada
3 Sept 2010	Jugada
4 Sept 2010	Jugada
5 Sept 2010	Martadi
6-10 Sept 2010	Sharing workshop in Martadi
7-10 Sept 2010	Kolti
11 Sept 2010	Reached to Kathmandu

Visited place: Mugu district Date(s): 9 Nov- 22 Nov, 2010	Visited by: Dr. Krishna Paudel, Madhav Dhital, Sujata Tamang, Sushila Kumari Thapa Magar, Ranga Bahadur Malla, Raghu Nath Yogi and Balsundari Shahi

Purpose of the visit: To document the food security status of the Jima and Dhainakot VDCs of the Mugu district.

Date	
9 Nov. 2010	Departure from Kathmandu and stayed at Surkhet.
10 Nov. 2010	Departure from Surkhet and reached the Mugu district and stayed at Gamgadhi, DHQ of Mugu district. Short interaction with Santosh Malla, a staff of SAHAS- Nepal.
9 Nov. 2010	Interaction with SAHAS Staffs, prepare VDC map of Gma, and collect necessary information of the respected VDC. Short informal discussion with DFO and DADO of Mugu.
10 Nov. 2010	Departure from Gamgadi to Jima VDCs. A wonderful welcome from the peoples of Khalcha. Key Activities: Group discussion about livelihood, food and agriculture status of the VDC. Interaction was held with three groups i.e. mother, father and child and youth club members. Key findings: Subsistence agricultural system with food sufficiency less than 6 months. Major agricultural crops are rice, wheat, chino, kauno, millet, maize, potato etc. Apple orchard (800 plants) was established with an hard effort by 54 HHs from Khalcha and production was satisfactory i.e. 2 quintal apple per HHs. Intercropping of buckwheat (1st year) and kauno (2nd year) at apple orchard was really best practice done by farmers. Observed local storage material for storing apple and stored 9-10 months, which is innovative practice of the farmers.
11 Nov. 2010	Departure from Khalcha to Bumcha, interaction with local people of Bumcha and stayed at Shipa Key Activities: Group discussion about food and agriculture status of the VDC with the peoples of Bumcha. Key findings: Subsistence agricultural system with food sufficiency less than 6 months. Major agricultural crops are rice, wheat, chino, kauno, millet, maize, potato etc.

13 Nov. 2010	Stayed in Shipa village. Key Activities: Group discussion and individual information was collected by questionnaire and interview method. Key findings: Subsistence agriculture, quite fertile land and with irrigation facility, most of them don't have land ownership/certificate
14 Nov. 2010	Departure from Shipa and stay at Dhainakot
15-18, Nov. 2010	Stayed in Dhainakot: Key Activities: Group discussion with the couple facilitators and staffs of CAED-Nepal. Reviewed of work done by CAED-Nepal at community's level. Collection of individual and household information by questionnaire and interview method Key findings: Have started concept of kitchen garden with suggestion of CAED, are in lack of tech
19 Nov. 2010	Departure from Dhainakot and stay at Dakcha
20 Nov. 2010	Departure from Dakcha and reached the DHQ, Gamgadi
21 Nov. 2010	Half day interaction meeting was held with different stakeholders concerning with the food security and agriculture at district level Key findings: Shared field experiences and findings related to food pattern, food aid, agriculture pattern etc. collected views of different individuals and the organizations working in the same field
22 Nov. 2010	Departure from Gamgadi and reached the Kathmandu.

10.4 Lists of participants involved in the study

District: Bajura

	Involved	Organization	Remarks
Team Members	Dr. Krishna Paudel and Indra Sharma	Forest Action-Nepal	
Facilitators	Shyam Thapa and Sarita Thapa	Peacewin	
Participants	Lal Bdr. Oli	Peacewin	
	PAF groups of Aatichour ward no. 1 and 9		
	Local farmers both male and female		
	District level stakeholders involved in food security network		

District: Mugu

	Involved	Organization	Remarks
Team Members	Dr. Krishna Paudel, Madhav Dhital and Sujata Tamang	Forest Action-Nepal	
	Sushila Kumari Thapa Magar	CARE-Nepal	
Facilitators	Santosh Malla, Ranaga Malla, Raghu Nath Yogi and Balsundari Sahi	SAHAS-Nepal	
	Lila Tamata and Ram Chandra Neupane	CEAD-Nepal	
Participants	SAHAS-Nepal, Gamgadi		
	CEAD-Nepal, Gamgadi		
	Prayas group- Dhaina		
	Local farmers both male and female		
	District level stakeholders involved in food security network		

10.5 Detail individual case studies

1 Background of the case study

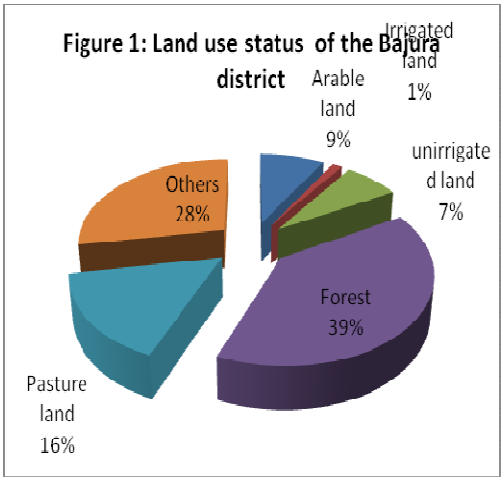
Mugu district is located in the Mid-Western Development Region of Nepal, surrounded to the west by Humla and Bajura districts, to the south by Jumla and Kalikot districts, to the east by Dolpa district and to the north by Tibet. The estimation of the total population in the whole district is 55415 inhabitants. The majority of the population comprises Hindus (89.7%) and then after Buddhist (9.9%). Chhetris (48.7%), Dalits (19.8%), Thakuri (16.8%) and Janajati (9.2%) are the prevalent caste and ethnic groups of the district. It is the least developed district of the nation with no road linkage and electricity facility. The district is politically divided in to 24 VDCs. Gamgadi is the district headquarter of the district. Due to the increasing trend of population and adverse climatic effect, the district suffered the food insecurity problems since 10- 15 years. In Mugu, only 5.2% land is arable and out of 5.2% arable land, only 6% is irrigated land. This figure indicated that this small percentage of irrigated land cannot afford the require amount of food for the growing total population of the district i.e. 55415. In other side, 30.5 %, 32.9 % and 25.7 % land is covered by forest, upland and pasture land respectively (DADO, 2065). The present study covers the two remote VDCs out of 24 VDCs of the Mugu district. The Jima and Dhainakot are selected for the study as these two VDCs are the most food insecure VDCs of the district.

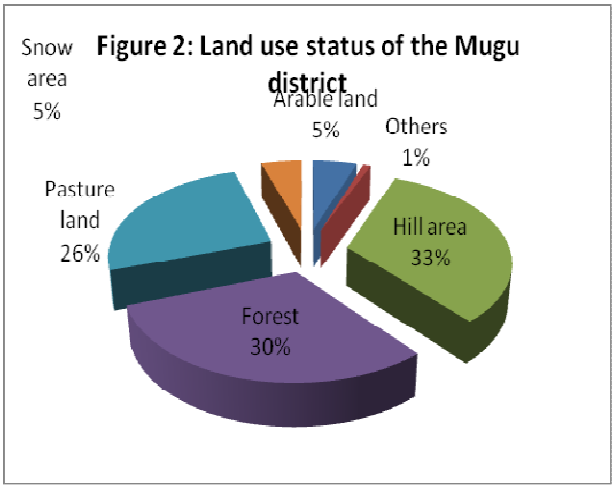
Bajura district is mountainous district situated in Far Western Developmental Region of Nepal. This district is surrounded by Mugu, Humla, Kalikot, Bajhang and Achham. It occupies an area of 2,188 sq. km. Bajura extends from 28 18' northern latitude to 29 5'

northern latitude and from 80 90' eastern longitude to 81 5'E longitude. It extends from 727 m to 7036 m altitude from sea level. It is the least developed district of the far western Nepal with no road linkage, electricity and telephone facilities. It is politically divided into 27 Village Development Committees. Martadi is the district headquarters of Bajura district. According to census 2001, its population is 1, 08,781 having 20,378 households and population density of the Bajura is 50/ sq. km. Bajura occupies about 0.47% of total population of Nepal. Education and health status of this district is also very poor. The literacy percentage is 34.1. It has one district hospital and 28 health post. Bajura is dominated by Hindu followed by Brahmin, kami, Thakuri and damai. 98.64% Bajureli speak Nepali as mother tongue. Most of people of this district are farmers. Farming, thus, is the main occupation of people. The total area of the district is 218800 hectors and has total 20155ha of cultivable land which is 9.21% of the total area of the district (DADO, 2065/066) total irrigated land of the district is 3010ha which is 15% of the total cultivable land. Paddy, wheat, maize, millet, barley and potato are major crops of this district (CBS 2005). Soil varies from place to place. Sandy loam and loamy clay are dominant soil types. About 23345 hectare land consists of red soil (11.5%). Agriculture and bare land occupy about 62.25% and 37.75 % respectively. Climate of Bajura ranges from sub-tropical to sub-alpine type. Spring is pleasant and winter is cold. The annual rain fall ranges from 25 to 80 mm. Most of the rainfall occurs during the monsoon season.

In Bajura, only 9.2% land is agricultural land (1.37% irrigated and 7.83% is the unirrigated land in total area). Forest land and pasture land covers the large area i.e. 39% and 16% respectively (DADO, 2066).

Similarly in Mugu district, only 5.2% land is arable land and out of this, only 6% is the irrigated land (0.5% of the total area). The forest and pasture land covers the 30.5% and 25.7% of the total land holding of the district. The distribution of the land in Bajura and Mugu district can be seen in the pie chart below. In both of the district, forest and pasture land occupied in large area and seems to be big prospects for livestock and NTFPs sector of the district.





1.1 Description of the studied VDCs

1.1.1 Jima (Mugu)

Jima (one day walk from the DHQ, Gamgadi for local people) is one of the most remote and food insecure VDC of the Mugu district. It is surrounded by the Rara and Kalai VDCs at the south, Fortu at the north, Ruga at the east and Natharpu at the west. The totals of 438 farming HHs are inhabitants at the VDC with the total population 2761 and average family size 6.3. The majority of the population has been covered by Brahmin/Chettry (81%) and little HHs are the Dalits (19%). The food sufficiency of the VDC is the less than 6 months for Brahmin/Chettry and less than 3 months from own production and rest months are depended on the other sources. The major agricultural crops of the VDC are the rice, wheat, kauno,

chino, millet, maize, beans and potato. The fruit crops like apple, pear, peach, walnut, olive etc. can be successfully cultivated. The livestock is another important income generation sector for the farmers.

1.1.2 Dhainakot (Mugu)

The Dhainakot (one and half days walk from the DHQ, Gamgadi) is another remote VDC of the Mugu district. The VDC is situated at the Viye at the north, Riatu, Kotgada and Shreekot VDCs at the south, Kalai at the east and Bajura district at the west. The total 405 HHs are inhabitant with the total population of 2405 and average family size is 5.9. The majority of the HHs is Brahmin/Chettry (87%) and rest is the Dalits (13%).

Rice, wheat, maize, kauno, chino, millet are the important cereal crops of the VDC. Climate of the VDC favors the cultivation of vegetable crops like cucumber, pumpkin, snake gourd, sponge gourd, potato, rayo, radish, cabbage, cauliflower and large scope for the high quality seed production of these vegetables. Beans, cowpea, and blackgrams are the important legume crops of the VDC. The fruit crops like apple, pear, peach, walnut, olive etc. can be successfully cultivated. The average food sufficiency of the VDC is less than 6 months for Brahmin/Chettry and less than 3 months for the Dalits communities.

1.1.3 Jugada (Bajura)

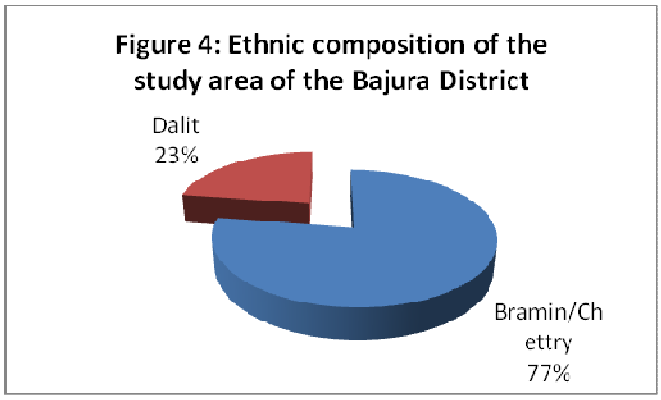
VDC center of the Jugada is situated 2 Kos west from the district headquarter of the Bajura district. It is surrounded by Martadi from east, Aatichour from west, Manakot and Dahakot from north and Budiganga VDC from south. Siudari gad, Budiganga River, Dhare stream and Khadi stream are the important water resources of the VDC. Rhododendron, pinus species, Phalat (Fir), Khiunu, Bhalayo, Junipours, Baj, Bhide, Kharsu, Alnus species, Bluberry are the important forest trees of the Jugada.

Agricultural diversity is the important features of the VDC. There are different agricultural crops produced by the framers according to the altitude, climate, temperature and land type and availability of irrigation. Important agriculture cereal crops are Rice, Millet, Wheat, Barley, Maize, Buckwheat, Soybean, Chino, Kauno, Jhumaro, Amaranths, similarly Potato, Clocacia, Radish, Carrot, Turnip, Broadleaf Mustard, Cabbage, Cauliflower, Onion, Chili,

Tomato are the vegetables and Bean, Horse gram, Black Lentil, are the important pulses of the Jugada. Total population is 5579 from the 868 households of the VDC. Majority of the population are Bramin and Chettry which is 47.52 percentage of total population and Janajati having only one household.

1.1.4 Aatichour (Bajura)

Aatichour VDC is situated 8 Kos west from the district head quarter Martadi of the Bajura. It is surrounded by Manakot, Dogadi, Gudukhati, Bramatola and Jugada VDCs of the Bajura district. Total households of the VDC are 633 out of which 112 households are fall under Dalits and rests are Bramin/Chettry. The aggregate population of the Aatichour VDC is 3642 in which 1900 are female and 1734 are male. Bramin/Chettry are the dominant caste and Janajati are absent in this VDC.



2 Methodology

This study followed the participatory research methodology. Through interviews, focus group discussion, document analysis and participatory social and resource mapping, with various groups of people of both male and female, detail information on food system, livelihoods and local economy were generated using various participatory tools of poverty assessment. Emphases have been given to generate desegregated data on class, caste gender and ethnicity, as far as possible. The steps followed in the study were as follows a) a brief discussion with partners at their office on the objective of the study, selection of case study site and plan for village level activities, b) w/s with different categories of farmers in the village including

other stakeholders c) visit and focus group discussions/interviews with male and female farmers and field observations d) sharing meeting with partners and other stakeholders.

3 General observations:

Mugu

- Jima and Dhainakot are the most remote VDCs of the Mugu district. Narrow and hilly road and seems to be difficulty for the transportation by mule.
- Poor service by governments officials in health sector in which responsible persons were absent and there is no any medicine in health post, education sector, all the school were closed since dashain festivals, agriculture and livestock sectors (till date, JT, JTAs will not be reached in respected VDCs
- In Dhainakot, WFP prepared irrigation channel during food for work program which is cemented only in the road corridor around 10 meters. In Sipa, small size irrigation channel was replace by wider sized, but till date there was no possibility of irrigation from this newly made WFP cannel.
- In Khalcha, good practice of apple stored was observed by locally made storage material and storage was last for 9-10 months.
- Sanitation problem has been seen maximum. None of the HHs prepared toilet till date.
- High expectation from the new comers. Dependency problem on food was high since WFP distributed rice in food for work programmed.
- Misuse of food like millet, barley etc for non food items i.e. alcohol due to the impact from WFP program. WFP distributed equal amount of food i.e. 160 Kg per HHs per year for all of the HHs which seems to be negative impact for higher food sufficiency HHs.
- The price of poultry seems to be high > Rs 1000/ cock, groundnut- Rs 12/ mana, Rs 5/apple, tomato Rs 4/Kg and Rs 2500/ small male buffalo around 1.5 years.
- Marketing problem of local products like apple, peach, chino, kauno, vegetables like cucumber, radish etc, locally made clothes and mats. Wastage of fruit and vegetable has been seen due to the lack of marketing and processing factories.
- Gender discrimination and caste discrimination is seen maximum.
- Deforestation was seen in several places which is one of the causes of drying of water resources in the study site.

Bajura

- Aatichaur and Jugada VDCs are the more food deficit VDCs of the Bajura district.
- Threatened farm based livelihoods and lifestyles
- Uniformity on food culture and monoculture in production system [in all case studies rice is main food for all household, single cropping, cash cropping , high value in terms of money]
- Lack of resources, inputs and services from government officials.
- Gender discrimination and caste discrimination is seen maximum.
- Deforestation was seen in several places which is one of the causes of drying of water resources in the study site.
- Marketing problem of local products like apple. Wastage of apple fruit been seen due to the lack of marketing and processing factories.
- Amaranthus (Marshe) and other indigenous crop is replaced by rice.
- Limited Innovations, inputs and technical know-how on sustainable agriculture
- Food and agriculture has been given least priority, except some famers and activity
- Road and market influence has been seen much more and it create dependency syndrome on market.

4 Social and demographic situation

4.1 Landholding size

Land is the important component of any farming system, which needs investment of labor and seeds to yield a product. Land ownership within the agrarian economy of the study area provides a major source of income, which is an important natural asset that farmers have. The two major types of agricultural land owned by households in the study area were; *Khet* consisting leveled terraces (with bunds to hold water) on which paddy and wheat is grown, *Pakho bari* is the dry land which consists of out-sloped, rain-fed terraces where crops like maize, millet, Kauno, Chino and other vegetables are commonly grown, Land tenure-ship of the sampled households was categorized in two major groups namely own land and shared-in land. The own land category was considered as the family having land in which the household has the sovereignty to use and sell. Shared in land is such land where household cultivate crops with output sharing to land owner but no authority to sell it.

Table 1: Distribution of households and land holding

Type of land (in Ropani)	District					
	Bajura			Mugu		
	Own	Sharing in	Total cultivated	Own	Sharing in	Total cultivated
Khet (Irrigated Land)	1.53	1.03	2.56	2.02		2.02
Pakho Bari (Rainfed)	3.09	0.95	4.04	5.45		5.45
Total	4.62	1.98	6.60			7.47

20 ropani = 1 hectre Source: Field study, 2010

Figures in parentheses indicate the percentage of respective category

In the studied areas, average own landholding size was 4.62 ropani in Bajura and 6.6 ropani in Mugu district, but the size of productive landholding *(Khet)* was quite small with an average of 1.53 in Bajura and 2.56 *ropani* in Mugu than that of *Pakho bari* (Table 1). The average land holding size of the studied area was very low than the average national holding 16 ropani (CBS, 2001). Total cultivated land per households of the studied area was 6.60 ropani in Bajura district and 7.47 ropani in the Mugu district which consists the own and sharing in land.

4.2 Household income analysis

Household members in the study sites were observed to support their household needs by engaging in different kind of farm and off farm activities. The study indicated that the share of total farm gross income to the annual household gross income was low (14 % in Bajura and 20% in Mugu) as compared to total annual off farm income (86% and 80% respectively). In case of farm income the main sources of farm income were livestock rearing especially goat and chicken and agricultural crops like garlic, potato, beans and pulses. In some studied areas wooden materials products such as Theka, Madani, Bambo products like Baskets, Doko, Dala, etc and iron products like spade, axe, sickle etc. and locally made clothes were the sources of income. Among all the income categories, remittance was a vital component of the gross income, which alone contributes (76% and 31% of Bajura and Mugu district respectively) of the total household economy throughout the study sites of the Bajura and Mugu district. This indicates that people from the studied site were migrated to India in search of employment at least one season of the year.

Figure 5:HHs income analysis of studied area of the Mugu district

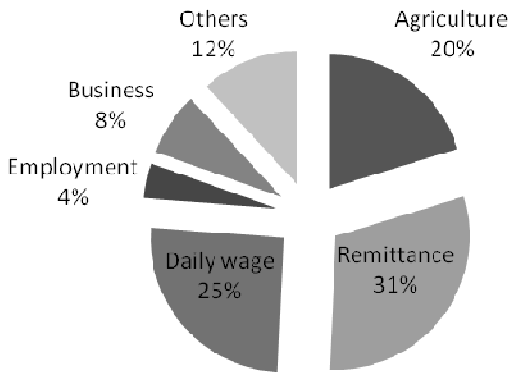
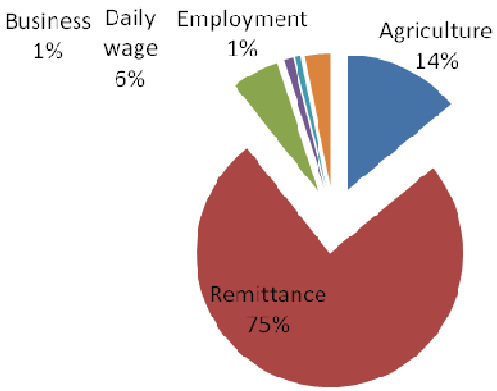


Figure 6: HHs income analysis of studied area of the Bajura district



4.3 Representation pattern in local organization

Representation composition in the community based organization including community forestry User groups, farmer's organization, women organization; saving organization indicates the role of representation person in the community decision making process. There were all together (21 in Bajura and 10 in Mugu) community organization including community forestry users groups, community organization formed by the poverty alleviation fund, saving groups, farmers groups in the studied areas of Bajura district. Representation composition according to the ethnicity and gender was shown in table 2. Out of the all population of the representation in the organization 58.62 percent of the studied areas were dalit. Similarly 51.34 percentage of representation was from male and 48.66 percent from female. This figure indicates that there were more dalit and women related organization and the representation in the combined organization were also balanced. From this information

we can conclude that there was no gap between ethnicity and gender and they have given equal importance to the community decision making process.

Table 2: Representations in the local organization

District	No. of organization	Representation composition								
		Dalit			Bramin/Chhetry			Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Bajura	21	81	72	153 (58.62)	53	55	108 (41.38)	134 (51.34)	127 (48.66)	261
Mugu	10	45	54	99 (39.6)	74	77	151 (60.4)	119 (47.6)	131 (52.4)	250
Total		126	126	252 (49.31)	127	132	259 (50.68)	253 (49.51)	258 (50.48)	511

Source: Field study, 2010
Figures in parentheses indicate the percentage of respective category

5 Agricultural Practices

1.1 Cropping pattern

Majority of the population depended on agriculture for subsistence in the study area. The cereal crops grown in the study area include: rice, wheat, finger millets, Maize, Potato, buckwheat, Barley, Amaranthus. Similarly, bean, lentil, pea, soybean were the major pulse crops grown in the area. The vegetable crops grown in the area were bean, chayote, garlic, onion, , radish, cabbage. The cultivable area was largely devoted to the production of rice, wheat and millet followed by buckwheat Barley, Amaranthus, and potato in non-irrigated lands (*Pakho bari*) whereas rice- -wheat was dominant cropping pattern in irrigated lands. The cropping patterns of annual crops grown in the study sites were as follows:

***Khet* land (Irrigated land):** Rice –Wheat

***Pakho bari* land (Rainfed land):**

Potato -Millet

Potato-Buckwheat

Chino/kauno-Wheat

Amaranthus-Wheat

Amaranthus/millet –Barley

Potato -wheat

Millet-Fallow

Maize/millets-fallow

Maize-Buckwheat/Barley

Millet- wheat

Paddy (Upland rice)-wheat

4.2 Livestock holding

Livestock is an integral part of Nepalese farming system and a major source of income particularly in mid hills and mountains economy. Almost all farmers' reared livestock in the study area. For the study of total livestock holding by common unit, Livestock Unit (LSU) was used converting all the livestock species in a single unit. The aggregated LSU was calculated as explained by Adhikari (2000).

LSU = 1 (cow/bull) + 1.5 (buffalo) + 0.4 (goat/sheep) + 0.6 (swine/pig) + 0.2 (poultry)

Table 3. Distribution of livestock unit and district

District	Livestock Unit
Bajura	5.64
Mugu	7.9
Total	6.77

Source: Field study, 2010

The average livestock holding size was 5.64 LSU at Bajura and 7.9 at the Mugu district (Table 3). It was found that most of the households reared Livestock for their livelihood in the study areas. Among different livestock in the area, goat farming was popular offering a secured source of income for the farmers. Although less income from the cow they have been growing large numbers of cow highest numbers in the study sites. The practice of buffalo-farming was quite limited and very few of households reared buffalo because of the unfavorable environment.

4.3 Problems associated with Agriculture/Livestock

There are many problems associated with technology, infrastructure and structural aspects. The general problems such as remoteness, lack of infrastructure such especially in road, irrigation, effective extension services such as lack of vet services and lack of effective plant protection measures, lack of technical knowhow, poor condition of the farming families, lack of extension services, lack of collection and storage facilities, marketing and lack of pasture

land for livestock etc. have been affecting the development of Agricultural sectors of the district. In addition, the habit of farmers of using traditional practices and decreasing trend of farm manpower due to migration in search of employment opportunities in India has created problem in the community.

5 Food Securities

5.1 Food sufficiency Index

All of the household which have studied were food deficit households. We have categorized the households in to four categories. First categories of people were having food from own production less than 3 months in a normal year. Similarly there were categorized having food up to 6 months, less than 12 months and 12 and above 12 months as second, third and fourth categorized and assign the value to calculate the food sufficiency index using scaling techniques. The index was prepared mainly taking into account the qualitative data. On the basis of responded frequencies, weighted indexes were calculated for the analysis of food sufficiency index of the study areas. food sufficiency index were ranked by using four point scales of on the basis of availability of food items from own production compromising availability of food from own production 12 and more than 12 months, less than 12 months, up to 6 months and less than 3 months 1.00, 0.75, 0.50, and 0.25 respectively. The formula given below was used to find the food sufficiency index of the study area. Then, the food sufficiency index for each variable was calculated by weightage average mean in order to draw valid conclusion and making reasonable decision. The index was computed by using the formula:

$$\mathbf{I_{fs}}=\sum \frac{S_i f_i}{N}$$

Where,
I_{fs} = Index value for intensity of food sufficiency
$\sum$ = Summation
S_i = Scale value of i^{th} intensity
f_i = Frequency of i^{th} category
N = Total number of households

Table 4. Food sufficiency index

District	Food sufficiency index according to ethnicity			
	Dalit	Bramin/Chettty	Janajatis	Total
Bajura	0.27	0.31	NA	0.28
Mugu	0.28	0.49	NA	0.38

Source: Field study, 2010

Table 4 of food sufficiency index according to the district and ethnicity reveals that the food sufficiency index of Bajura district was 0.28 this indicates that most of the households have less than 3 months of food from own production and rest of months depended on the import food items. Availability of food from owns production in case of Dalits community was less than the Bramin/Chettry community people but the difference was very low only 0.04 in Bajura and quite high i.e. 0.21 in Mugu district.

5.2 Sources of consumptive items

Among the different sources of food for consumption people in the study area have been consumed food from own production, market purchases the imported items, purchased from the Nepal food corporation, different donors agencies like National level Non-governmental organization, International Non-governmental organization and buying the local products from near or distance producers. In Bajura district, they have been consumed imported items from market which constitutes5.38 months in a year that was 44.75 percentage of total consumption. Only 2.75 months of the year they have been using own produced food items in a normal year. In Mugu, 4.5 months in the year is sufficient for own production and rest months are dependent on other sources. A detail of their food sources and that consumptive months and percentage is presented in table no 5.

Table 5. Sources of Consumptive food items

District				
	Own production	Market purchase only imported items	NFC/NGOs/INGOs	Local products from neighbor
Bajura	2.75(23)	5.38(44.75)	2.63(21.5)	1.25(10.75)
Mugu	4.5(37.5)	2.5 (21)	2.25 (18.5)	2.75 (23)

Source: Field study, 2010
Figures in parentheses indicate the percentage of respective category

5.3 Food consumption Ratio

Despite the great variety of food items consumed in the study area, the basic foods of which the items are composed are relatively few, especially if regarded in more or less homogeneous groupings. People ate the cereals such as rice, finger millet, wheat, maize, Barley and amaranthus and non cereals like potato, pulses, vegetables and animal origin products. For present study purposes an even similar classification of food items was useful

namely cereal and non cereal. Food consumption pattern in terms of cereals and non-cereals food items represents the food habit of people. In this case cereal represents the rice, wheat, maize, barley, finger millet and Amaranthus and non cereals represent the potato, vegetable, root crops etc. From table 6 we can conclude that more or less they were dependent on cereal crops all around the year. Only half months i.e. 0.54 month in Bajura and 0.8 month in Mugu, they consumed non-cereal food items during a year.

Table 6. Food consumption ratio on the basis of cereal and non-cereal food items

District	Food consumption pattern in months around year	
	Cereals	Non-cereals
Bajura	11.46(95.25)	0.54(4.75)
Mugu	11.2(93.34)	0.80(6.66)

Source: Field study, 2010
Figures in parentheses indicate the percentage of respective category

Consumption preference of food commodities

The foods were ranked from first to eight by the people of study area which can be seen in table 7. The available major crops are rice, millets, wheat, maize, potato, barley, amaranthus, chino and kauno. In both of the district rice is top most preference by the people and maize is the least priotize crop in both of the district.

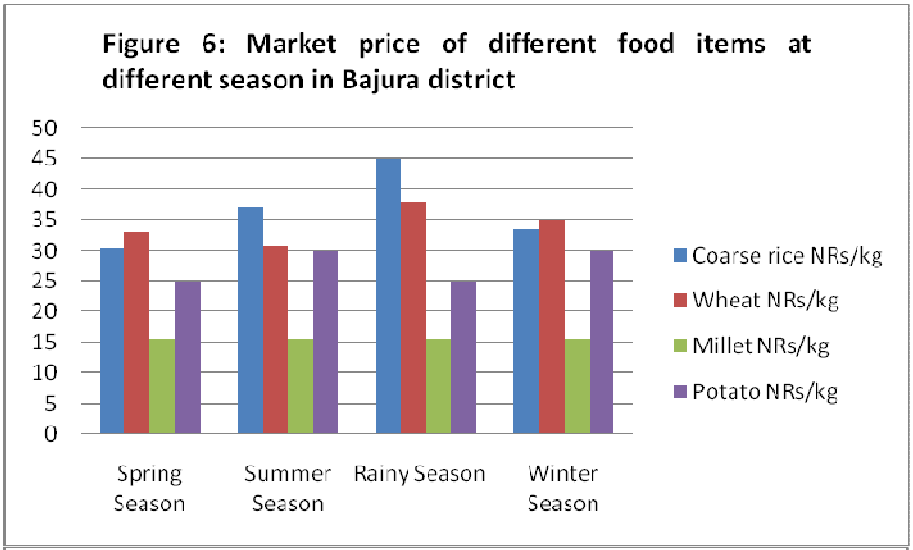
Table 7. Consumption preference ranking of food commodities and district

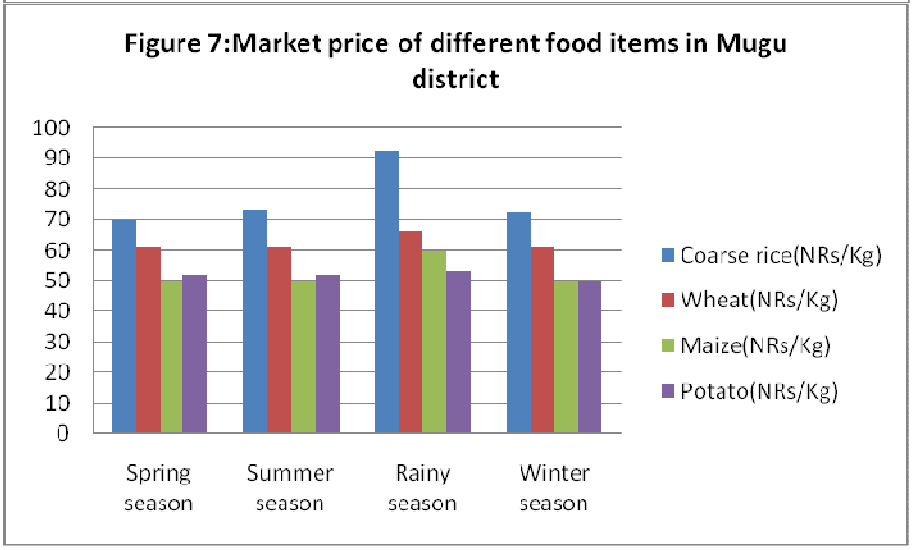
commodity	District wise consumption ranking	
	Bajura	Mugu
Rice	I	I
Finger millet	II	V
Wheat	III	II
Maize	IV	VI
Potato	V	VII
Barley	VI	VIII
Amaranthus	VII	
Chino		III
Kauno		IV

5.4 Market price of food items in different season

The market price of the different food items during different seasons in Bajura district has been seen in the figure 6 and 7. The figure showed that the market price of the food items

fluctuating round the year and it goes higher during the month of Ashad, Shrawan and Bhadra. The study showed that the price of the coarse rice found higher (Rs 45/kg in Bajura and Rs 92/kg in Mugu district) as compared to wheat (Rs 38/kg and Rs 66/kg), millet (Rs 15.5/kg) and potato (Rs 25/kg and Rs 53/kg) during those months. During rainy season, difficulties have been undertaken in transportation of the food items due the erosion and landslides.





6 Migration and its consequences

The seasonal and short-term out-migration is more prominent and rampant in mid and far-western region (study areas). The seasonal Short-term out-migration refers to the out-migration where the migrating member comes home once a time in a year and long-term out-migration (temporary) refers to the out-migration where the migrating member comes home

once a time in more than one year. Generally, the seasonal migration and short-term outmigration in hills and mountains of the region to India for employment purpose has become accustomed convention in the mid and far western area till date. Due to the open border situation and employment opportunity in India more exodus of Nepalese labor are moving into India. A detail of out migration and permanent in migration is presented in table 8.

Table 8. Migration according to categories

Migration category	Bajura			Mugu		
	Male	Female	Total	Male	Female	Total
Permanent migration since 1991	9 family			25 family		25
Long term outmigration	34	16	50	31	12	43
Seasonal and short term outmigration	104	8	112	105	20	125
Total	138	24	162	105	20	125

Source: Field study, 2010

6.1 Causes of Migration

The share of population among geographic regions, mountain and hill are losing day by day due to this migration. Migration from hill has led to poor management of agriculture land in the area. The population pressure is decreasing in mountain and hill but shortage of labor in peak seasons of agriculture has ultimately created low productivity. Out-migration in Bajura district has become a distinguished feature in majority of households since the earlier periods. It has become a common culture for their sustenance. Lack of the very basic livelihood opportunity and poor condition of irrigation facility along with limited arable land have become the prominent causative factors forcing the people to leave the place with their growing young's and beloved wife. Illiteracy, smaller land holding were the dreadful determinants of out-migration. Thus they were distinguished with lacking livelihood options in their own area, with no cash and employment opportunities. This depicts their severe deprivation that they could not compromise with the hunger of their children, wife and family and finally resorted to migration. The migration in Bajura and Mugu was characterized by both cause and consequence of poverty. In one hand deeply rooted poverty have forced them to leave the area, in the other hand they have not acquired the better opportunity cost so that they could improve their livelihood.

Out-migration is occurring in the area due to absolute poverty rather than other reasons. This also means the agricultural production system is very weak in the area. According to the saying of the respondents and information drawn during informal group discussion, irrigation and poor geographical settings were the most limiting factors for improving the agricultural production. Similarly, reporting lack of cash as second important reasons try to imply that people need cash for meeting the emergent household expenses. This ultimately implies that the people of the area have no any micro-credit facility, marketing facility for the disposal of the agricultural commodities and unavailability of non-farm employment opportunities in the local areas.

6.2 Effect of migration

The effect of migration mostly depicted in socio-economic variables such as agriculture, education, child care, family health and livestock rearing. They said that mostly four areas are most affected by migration viz agriculture, education and child care, family health and livestock rearing. The findings revealed that large proportion of the households were having the difficulty in agriculture profession due to the migration. Here the more difficulties in agriculture profession forecast that this profession is in pressure and is cumbersome to continue. This proves that agriculture sector has been victimized highly by the out-migration process. People reported that education and child care was second area affected by the out-migration. This might be due to the extra burden in left-out family that the family could not manage all the family arrangement activities and even children had to pay and contribute their service in household chores. Similarly, family health was reported as the third area affected by out-migration. Livestock rearing remained as fourth affected area reported by small number of people in the study area of Bajura and Mugu district.

6.3 Distribution of Remittance

The remittance use pattern was mainly dependent upon three factors, namely; Socio-economic background of the migrants, mode of financing the migration and duration of stay in host country. In the study area all of these factors are more or less similar so there is no distinction between the categories. Uses of remittances from India were analysed to know the remittance distribution of Seasonal and short term out migration. Study in the Bajura and Mugu district indicates that bulk of remittances was spent on consumption, debt repayment, and buying cloths and health. 80 in Bajura and 72.5% in Mugu of total remittance was used

for buying food items (Table 9). It indicates that for migrant families from poor economic background, first and foremost priority is to raise their consumption standards rather than make productive investments.

Table 9. Uses of remittance with sector and district

District	Percentage Remittance used sectors			
	Schooling of Children	Buying Foods items	Paying loans	Others activities like cloths, Health etc
Bajura	0.5%	80%	17%	2.5%
Mugu	1%	72.5%	20%	6.5%

Source: Field study, 2010

In India they were working in various sectors of the economy including agricultural farm, manufacturing, and construction as a labour. It was found that economic status and living standards of migrant's families at the origin had positive impact on remittance utilization patterns as better status.