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Food Security And Vulnerability Status In Nepal

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INTRODUCTION

Vulnerability

Vulnerability is defined as the probability of an acute decline in food access, or consumption levels. Vulnerability represents defencelessness, insecurity and exposure to risks, shocks and stress and difficulty in coping with them. In order to sustain, a household has to cope with all hazards and risks that it has to confront. In this constant battle against risks, the level of success depends on the level of entitlement. Thus, vulnerability has two components : Vulnerability = Exposure to Risk + Inability to Cope.

Thus, acute fluctuations in consumption that are primary concern in vulnerability analysis are the result on an inability to cope with variety of risks which may affect households access to food. The opposite way of examining vulnerability is livelihood security. Livelihood security has been defined as the the command an individual, family, or other social group has over an income and/or household is defined by its household level entitlements. In other words, household livelihood security implies sustainable, adequate access to income and resources to meet basic needs. It consists of nutritional securiyt, health security, food security, education security and economic security among others. Thus, food and nutritional securities are subsets of livelihood security. Livelihoods are secure when households have secure ownership of, or access to, resources and income earning activity, including resources devoted to food and health service acquisition, the higher the vulnerability of households to food and nutritional insecurity.

Food security has basically three dimensions: availability, access and utilisation. Availability generally refers to production and physical availability of food crops in a given area, say a country or a community. Access refers to economic access to food, i.e., the purchasing power of the people concerned, and utilisation refers proper use of food commanded by a household from its entitlement. Food availability is a community level concern, its access is a household level concern and its utilisation is an individual level concern. Related to the three dimensions of food security it the another dimension, the vulnerability, which refers to a range of external

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factors and risks that expose people to food insecurity across the other three dimensions. A detail exposition on the food security is given in following sections.

Food Security

Food security has been a consistent theme raised in specific contexts in a number of world conferences convened by the United Nations in the 1990s. The Conference on Environment and Development, held in Rio de Janeiro in 1992, emphasised on the need to ensure food security at all levels, within the framework of sustainable development, as defined in Agenda 21. The Joint FAO/WHO Conference on Nutrition which was held in Rome in 1992, declared that "hunger and malnutrition are unacceptable in a world that has both the knowledge and the resources to end this human catastrophe", and recognised that "access to nutritionally adequate and safe food is a right of each individual." The World Conference on Human Rights (Vienna, 1993) emphasised the need to ensure that everyone enjous a right to food. The International Conference on Population and Development (Cairo, 1994) highlighted the linkage between population growth and food production and the need to evolve global measures to satisfy the ever growing food needs. The World Summit on Social Development (Copenhagen, 1995) made a strong commitment to the campaign against hunger through its emphasis on poverty eradication. The Fourth World Conference on Women (Beijing, 1995) drew the attention of international community to the key role played by women in food production. The Habitat II Conference (Istanbul, 1996) specified the need to establish healthy linkages between rural and urban areas and emphasised the role of cities in ensuring proper food distribution and drinking water supply. The World Food Summit (Rome, 1996) which took place at a time of growing international concern over slow growth in global food production and expanding population, gave a new impetus to the fight for food security by focusing attention on the food issues (George 1999).

The concept of food security as understood now has been evolved over the last quarter century. Food security concept has been considered at a number of levels: global, regional, national, household and individual. While the ultimate concern may be at the household and individual levels, it is important to realise that food security at the levels outside the household has a strong bearing on the performance at the household level. This is more pertinent in a country like Nepal which is landlocked and has most of its parts remote and inaccessible.

FAO had formulated that the basic concept of food security implied that all people at all times have both physical and economic access to the basic food that they need. The World Bank has modified this formulation to indicate that food security is access by all people at all times to enough food

for an active, healthy life. Its essential elements are the availability of food and the ability to acquire it. The World Bank has made a distinction between chronic and transitory food insecurities. Chronic food insecurity reflects continuous inadequate diet caused by the inability to acquire food. It affects households that persistently lack the ability to either buy food or to produce their own. The transitory food insecurity is defined as a temporary decline in the household's access to enbough food. It results from instability in food prices, food production and household income, and in its worst form, it produces famine.

The World Bank Definition Has The Following Components:

Access to Food

Physical availability of food is a necessary but not sufficient condition for ending hunger. People require assured access to food. The route to that acess may consist of income or work opportunities or the ability to acqurie food through production, exchange, or social entitlement progrmammes.

Access To Food By At All People

Food security at the national or regional level does not necessarily indicate food security at the local or personal level. Oftern there is great disparity in food security anong regions, communities, households and individuals. The ultimate end of food security boils down to the household level and then at the individual level.

Access To Food At All Times

Transitory food insecurity can transform into chronic food insecurity. Civil and external conflicts as well as natural disasters seriously disrupt food production, orderly marketing and stewardship of food reserves. Thus, there is a need for conflict reduction and resolution and support disaster preparedness and mitigation activities so as to lessen the incidence of even the transitory food insecurity.

Access To Enough Food For An Active, Healthy Life

Food security means that individuals and households have access to sufficient food both in quantity and quality to meet their nutritional requirements. However, adequate food supply is not the only condition for ensuring an active and healthy life. Unless there is access to proper health care, water supply and other basic services; adequate amount of food intake by the individual members; and equal distribution of food among the women and men and among the girl and boy children of family, the food will not be efficiently utilised.

The components outlined above clearly indicate the three basic dimensions and one additional dimension of food security, viz.,

availability, access and utilisation, and then vulnerability. In its wider sense, food security incorporates what is often referred in quality of life indicators. Accordingly, food security implies livelihood security at the level of each household and all members within, and involves ensuring both physical and economic access to balanced diet, safe drinking water, environmental sanitation, primary education, and basic health care. Above all, food security depends upon available income, consumer's food habits and the cost faced by consumers in accessing food in hygienic condition.

DETERMINANTS OF FOOD SECURITY

The determinants of food security are numerous. Among them some of the determinants are grouped into the following heads :

Natural Resources -	Rainfall levels, Soil quality, Water availability, Access to forest resources.
Physical Resources -	Livestock ownership, Access to infrastructure, Farm implement ownership, Ownership and access to and, Other physical assets.
Human Resources -	Gender of household head, Dependency ratio, Level of education, Household size, Age of household head.
Production -	Total cultivated area, Irrigated area, Fallow area, Access to and use of inputs, Cropping pattern, Crop diversity, Crop yields, Food production, Cash crop production, Number of sources of non-farm income, Cotage industry production.
Income -	Total income, Crop income, Livestock income, Wage income, Producer's prices, Access to market, Migrant income.
Consumption -	Total expenditure, Food expenditure, Non-food expenditure, Consumer prices, Dietary intake, Food frequencies.
Nutrition -	Anthropometry, Serum micro-nutrient levels, Morbidity, Mortality, Fertility, Access to health services, Access to clean water, Access to adequate sanitation.

Risks And Hazards

Environmental Risks

Because of its topography and low level of socio-economic development, Nepal has been facing disasters that cause loss of life and property annualy. Major disasters that affect Nepalese economy are flood, landslide, epidemic, earthquake, fire, avalanche, thunderbolt, windstorm, and hailstorm. Among these, flood and landslide are the major disasters

that cause loss of life, livestock, cropland and properties. In case of human life loss, epidemic appeared major disaster during the last decade, and was followed by flood and landslide, wind storm/thunderbolt/hailstorm and fire, respectively. The country has also the fear of seismic activities. In 1988, earthquake appeared as the major disaster that affected 66, 000 families. Besides, fire is the most common event that occurs in many parts of the country (HMGN/NPC/CBS 1998.)

Northern belt of Nepal is mostly covered with high snow-capped mountains including the highest peaks of the world, where avalanche is a common phenomenon. The impact of this was observed in five districts during 1995 but only one district in 1996. Deforestation and devegetation, heavy and localised rainfall due to monsoon, stimulate occurrences of flood and landslides which affected as high as 71 districts in 2000.

Fire is one of the major disasters that appear all over the country causing a great loss of foodgrains and other property and therefore it has serious implication to food security. It affected 72 and 67 districts in 1995 and 1996, respectively (HMGN/NPC/CBS 1998).

Economic Risks

Economic risks are also of primary concern in case of Nepal where there are frequent changes in government polices and programmes, and where there are frequent changes in prices of commodities due to open border. Moreover, lack of storage, access to infrastructure and othr facilities, the prices are volatile. The physical inaccessibility to most parts of the country is further aggravated during the monsoon when there is heavy rainfall prohibiting smooth transportation of good and services due to landslides and floods. Variation in prices has greater effects on the lives of the poors who lack sufficient entitlements to mitigate those effects.

Some of the changes in the polices as a result of structural adjustment, privatisation and deregulation and removal of subsidies have resulted into increase in the prices of basic necessities and inputs which has eroded the capacity of farmers of mitigate the effects of risks as their productive base is limited and income sources are less diversified.

The demand for the agricultural commodities is relatively inelastic, whereas its supply is volatile because production and supply of agricultural commodities depend on the vagaries of monsoon. In a year with favourable monsoon, the poor farmer do not get the proper price of their produce because the prices are low and because they have to sell their crops even during the low price season such as in the harvesting season. On the other hand, when there is unfavourable monsooon, poor farmers lack adequate food and therefore are marred with high prices of fodgrains. This makes them live in ups and down and hardly gives an opportunity to plan for a long run and create assets so as to fight against risks in the future.

Social Risks

Maoist insurgency, which started from few districts of the Mid-Western development region of the country since 1995, covered now most parts of the country. This has also created uncertainty and fear among the people. There is also economic loss because of the withdrawal of activites Mass exodus of people to cities resulted into decrease in the economic activities in the rural parts of the country. After the restoration of democracy in the country, civil strife and social unrest are on increasing trend, which have severe implications on food security.

Political Risiks

Within a 10 year period of democracy, there are frequent changes in the governments, top level government officials, and as a result there is frequent change in the polices of the government. This has resulted into uncertainty among the people.

Health Hazards

Diarrhoea, acute respiratory infection, and worms are coomm in nepal. They show therir ugly heads among the poor, and they claim deaths of children and infants every year. These diseases are mainly the outcomes of lack of safe drinking water and poor hygienge and sanitation at personal, dinestuc abd cimmunity level. Lack of awareness of these diseases among the community people make them further suffer from these diseases. Besides, some epidemics like cholera, measles outburst and claim the lives of the people. They make families further vulnerable by affecting human capital, productive capital and thereby adversely affecting the capacity of people to mitigate other types of risk and hazars.

Animal Diseases

Animal husbandry serves as a cushion for mitigating the effects of disasters, and is productive capital that helps generate further production and income especially in the agriculture sector. The outbreak of various animal diseases, such as diphtheria, kills many animals and lack of animal jinsurance results tnto great loss of peope's productive assets and erode their future capacity to mitigate the effect of natural disasters.

AVAILABILITY OF FOOD

Rainfall Levels

Despite the agriculture's share decreased from two-thirds to around 40 percent during the last three decades, it is still main economic sector of the economy as it engages more than 80 percent of the total population of the coutry, most of them from rural areas. Thus, the development of the agriculture sector means the upliftment of the living standards of the

majority of the populace of the country. Realising this, Agriculture Perspective Plan 1995-2015 incorporates irrigation as one of the main input priorities in its strategy.

In spite of the government's emphasis on the agriculture development, only one-fifth of the total cultivated area is under irrigation. Thus, rain fed cultivation is the predominant from of cultivation in Nepal, which prohibits this sector being commercialised fast. In view of the lack of physical access due to rugged terrain and lack of irrigation and slow introduction of HYV technology, the agriculture sector is still traditional in Nepal, which has pertinent implication from the point of view food security. Thus, an analysis of rainfall levels and its pattern carries of prime significance.

The rainfall of Nepal is charactersed by high variability both in terms of the location and time. This is manly because most of the rain, the country receives during monsoon which extends from mid-June to mid-September. The remaining eight months are more or less dry. Monsoon enters in the country from east and moves to west with less and less rainfall. The mean annual precipitation is about 1,500 mm varying significantly according to location. Generally, more than 80 percent precipitation is experienced during monsoon. The cyclical trend of the monsoon and lack of ensured irrigation facility serves as an impediment to the sustained growth in agricultural production of Nepal. Thus, Majority of the population survival is tied up with the vagaries of monsoon, leading them more vulnerable.

Natural Resources and Their Uses

Natural resources of Nepal consist of its cultivable land resources, forest resources, soil and water resources and its biological diversity, which are critical to the livelihoods of people of the country. Moreover, biological diversity of Nepal is of global interest. A sustainable use of these resources reduces the level of vulnerability of people.

Cultivable Land Resources

According to Land Resource Mapping Project (LRMP) 1986 land man ratio was 4-5 persons per hectare of farm land, with the greatest density being found in the hill regions of the country. Again, in hills almost all of the forest and grassland were within 4 km of human settlements and therefore they were subject to pressure (MPFS 1988). According to 1991 census there are about 8 persons per ha of cultivable land.

Between a ten-year period of 1981/82 and 1991/92, there was five percent increase in the cultivable area of the country (HMGN/NPC/CBS 1995), whereas population has increased by more than 23 percent during the same period. This signifies increasing land pressure on the cultivable land of the country.

There is a general agreement that substantial further increases in the cultivable land area are not feasible in the hills and mountain regions of the county. There is some scope for such increases in the Terai, especially in the west, but even this is limited. Given the current growth rate of population, 2.37 percent, the per capita land availability will further decrease in the future. This signifies that unless the agricultural productivity is increased significantly, the problem of food shortage will be further aggravated.

The increase in food production in the past was mainly attributed to increase in cultivated area and cropping intensity rather than increase in agricultureal productivity. The productivity of food crops excluding wheat has not significantly increased. The Agricultural Perspective Plan 1995-2015 implemented by the government assumes to increase agricultural productivity in order to develop the country. However, a significant progress in agriculture does not seem to be forthcoming. The monitoring and evaluation of APP performance is also not effectively operational currently.

The productivity of cropland is also adversely affected by the loss of siol and nutrients as a result of unsustainable farming practices. One cause is the high cropping intensity relative to the availability of water, and another is the cultivation of marginal land on steeper slopes with poor terracing.

Forest Resources

The total forest and shrub area of Nepal was 6.7 million hectare in 1964/65 which reduced to about 6.3 million hectare in 1978/79. The overall annual decrease was 0.4 percent, with a highest decrease in Terai. The Master Plan of Forestry Sector estimated about 6.2 million hectare forest and shrub cover during 1985/86. Thus, during 1978/79-1985/86, the overall annual decrease of forest and shrub cover was 0.2 percent which is just half of that of the period 1964-65-1978/79. But the rate of decrease in Terai was further intensified. It has been found that the overall annual decrease of forest and shrub cover during 1985/86-1990/91 was 1.5 percent which is significantly higher than that of the other preceding two periods, but the rate of decrease in Terai has been lessened.

Based on the above analysis, it is inferred that :

— Although the forest depletion has been lessened during 1978/79-1985/86 as compared to that of 1964/65-1978/79, it has further increased furing 1985/86-1990/91.

— As compared to the preceding two periods, the annual rate of decrease of forest and shrub cover in Terai has been lessened during 1985/86-1990/91.

— In high Himal, a significant decrease of forest and shrub cover was found during the 1985/86-1990/91, whereas no decrease was found in the forest and shrub cover there during the preceding two periods.

In view of the above analysis, two conclusions emerge which are of serious concern. Firstly, the composition of forest degradation is changing with time. Secondly, in spite of the success of the community forestry programme in the hills and decrease in the rate of deforestation in the Terai, the overall decrease of forest and shrub has intensified during 1985/86-1990/91. Underlying the second conclusion are two reasons: i) under community forestry programme of the government only some forest was handed over to the community people by 1990/91, and therefore the success of the community forestry prgramme has been blurred in the later period; and ii) there was a significant decrease in forest and shrub cover in high himal during 1985/86-1990/91, but there was no decrease in the preceding two periods ! However, as the coverage of community forestry increasing, it is very likely that forest resources of the country will not decrease in the recent future.

The hills of Nepal are part of a dynamic geological system that is prone to natural environmental change. Thus, even without a human population the resource base is subject to active natural processes of denudation and mass wasting (Ramsay: 1986; Carson: 1992). In view of this, there is some reservation on the validity of data for the high himal in the preceding two periods. Moreover, there is some disagreement among the concerned experts about the increae in the annual decrease of forest and shrub cover in the latter period which merits their serious attention for further exploration.

A comparison of forest and shrub cover data of MPFS (1985-86) and National Forest Inventory 1992-96, reveals that the forest and shrub area has been reduced from about 42.2 percent to 39.7 percent of the total land area of the country, with highest decrease in the central development region, 5.6 percent, followed by the far-western development region, 4.9 percent. The forest cover was 37 percent and shrub cover was 5 percent of the total area of the country in 1985/86. According to National Forest Inventory of 1992-96 the corresponding figure was 29 percent and 10 percent respectively. The changing demography of forest biomass in the recent year is of particular concern.

Thus, ERL (1988) pointed out farming system and domestic energy requirements as the major causes of forest degradation and therefore recommends the use of fertiliser and decrease the number of cattle to reduce the extent of the deforestation. Bajracharya (1983a, 1983b) held that conversion of forest into agricultural terraces as the reason for deforestation. Whatever may be the cause of deforestation etither fuel or food demand, correct incentives always have their place in alleviating the problem.

Biological Diversity

Since 1973 Nepal has established an extensive network of protected areas which covers about 17 percent of the country's area. They include eight national parks, five wildlife reserves, two conservation areas, one watershed and wildlife reserve and one hunting reserve. Two of the national parks, Royal Chitwan and Sagarmatha, are listed by UNESCO World Heritage Convention as World Heritage Sites. The Koshi Tappu Wildlife Reserve has been designed as a Wetland of International Importance in 1987 under the Ramsar Wetland Converntion.

In addition to their ecological and cultural importance, the protected areas are a crucial economic resource of Nepal. The parks, Sagarmatha, Langtang and Royal Chitwan, and the Annapurna Conservation Area form the basis for international tourism industry. The parks and reserves also provide natural resources such as thatching grass to surrounding communities in tarai, whereas they also provide fuelwood, fodder and timber in the mountain (HMG/UNDP 1994).

The increasing pressure from agricultural communities adjoining the parks and reserves, the pollution from tourism and the loss of lives and crop damaged by park animals surrounding the park save some of the negative impacts on the protected areas. The lack of understanding and partnership between parks' staff and communities results into the threats to biodiversity and economic value of protected areas.

Biodiversity is treated as a global commons by the developed countries and therefor it is expected that the host country has a responsibility to conserve the biodiversity within its borders regardless of opportunity cost.

Compared to the hills, the opportunity cost of conserving biodiversity in the terai part of Nepal is high. The global marginal benefits of abatement require a higher abatement cost in terms of increasing the area of habitat under protection in Nepal. In view of the widely rampant poverty and food insecurity in the country, it could be difficult for the country to protect biodiversity. This asks for the global support for maintaining the environmental quality as well as reducing poverty and food insecurity and increasing welfare of people of the country. Since deforestation, species extinction, and habitat degradation have a negative externality to the world, the developed world should help in the development of Nepal by providing environmental friendly technologies and other supports through some international arrangements such as global environmental facility and debt for nature swaps, and mechanism like transferable development rights. The conservation of biodiversity and the protection of forest also help maintain soil fertility in the country, which makeNepal achieve its objective of food sufficiency.

Human Resources

Food security is also governed by the quality of human resources that is defined by different demographic characteristics such as sex and age, dependency ratio, household size, level of education, etc. According to the 1991 population census the growth rate of population is 2.1 and the current growth rate is 2.37 percent and at this rate it will take only 29 years to double the population. The population of Nepal is expansive population. Over the time the proportion of the younger population is increasing. This is mainly because the higher fertility rates in the past, 5.6 to 6.3 in the past two decades. The average household size in 1952/54 census was 5.4 which increased to 5.8 persons in 1981 and then decreased to 5.6 persons in 1991. Compared to 1981, household size decreased in all the development regions in the 1991. The decrease in household size was larger in Terai than that of mountiaon and hills. However, there is a gradual decline in the fertility rate over the time. The geographical distribution of the population is also changing which has implication with the food security problems. The proportion of the population living in Terai has been increasing with the time. For example, only 35 percent of the population lived in Terai in 1952/54 which increased to about 47 percent in 1991. There is a migration of population from mountain and hill to terai region of the country. By development region, followed by the Western Development Region in 1991 as compared to the 1981.

According to the 15 sub-regions, 5 development regions x 3 ecological belts, the proportion of the population has decreased from all the five sub-regions of the mountain region in 1991 as compared to the 1981. Such a decrease was noticed in all the sub-regions of hill except the central hill. In case of the Terai, the proportion increaed in all but one sub-region, the Eastern Terai. The significant increase was in Central Terai. The absolute number of people in some mountain districts like Taplejung, Manang and Mugu decreased in 1991 as compared to the 1981. The growth rate of population is highest in far-western terai, 4.59 percent, and lowest in western mountain, -0.15 persent.

The proportion of younger population less than 15 years was 40.4 percent in 1971 which increased to 42.4 percent in 1991. Similarly the proportion of ageing population also increased form 5.6 percent to 5.8 during the same period. Thus the dependency ratio increased from 85 percent to 93 percent during the corresponding period.

Agricultural Production

Shakya and Singh (2000) estimated annual growth rate of area, production and productivity of six food crops: rice, maize, wheat, barley, millet and potato, and three cash crops: sugarcane, oilseeds and tobacco during 1978/79 to 1997/98. The annual increae of production of paddy, maize and wheat was 2.5, 4.0 and 5.9 percent, respectively. But during the

same period, the area under these crops increased by 1.0, 3.8 and 4.0 percent, respectively. As a result, the increase in yields was only 1.5 percent for paddy, 0.2 percent for maize and 1.9 percent for wheat. This indicates that whatever gain has been achieved in the agriculture is mainly the outcome of the increase in area rather than productivity gains. Among the other three crops, barely increaed by 1 percent and potao by 2.6 percent whereas that of millet was negligible. As to the cash crops, the noticeable yield increase was of sugarcane by one percent whereas that of oilseed and tobacco was negligible, 0.2 percent.

Agricultural productivity depends on a large number of factors, and of them the soil fertility is of utmost importance. Evidences abound abound showing that thre is declining soil fertility which is the most crucial factor for the decline in crop productivity. Indiscriminate invasion of agriculture into forest and expansion of agriculture into steep sloppy land resulted into loss of soil and natural vegetation. This together with the siol mining resulting from use of HYV, intensive mjltiple cropping, and inadequate and imbalance fertilisation has declined the soil fertility. There is general agreement that application of farmyard manure (FYM) or compost is good for all siols, but it has been difficult to prepare enough compost because of the lack of forest-based products. Farmers are of the view that the decrease of compost and application of only chemical fertiliser makes soil hard and dry and make difficult to plough.

The farming systems in the hills are characterised by the interdependence of three components : livestock, forest and crop production. Their interdependence has been a key to recycling of nutrients in hill agriculture but changes or pressure on those components are reflected in soil fertility. Among the more important changes recently were the reduction in the number of livestock, forest degradation, and reduced availability of labour, development of community forest and stall feeding of cattle. Several surveys have indicated that farmers' concern about long term soil fertility is widesperead and in some regions well founded.

Despite a number of recommended varieties of crops for different altitudes, large proportion of farmers is still growing local varieties having low yield potential. The poor adoption of improved varieties could be due to limited or less availability of seeds and other types of agricultural inputs; inappropriateness of varieties being selected and/or developed and so many other factors. Thus, the core problem lies in the limited or less availability of farmers' pertinent adoption criteria for improved rice variety selection, which are specially afected by biological performan of the crop and socio-economic factors.

Export And Import Of Food

Until 1970s, agricultural exports had a large share in the total foreing exchange earnings. These began to decline and by the 1990s Nepal's trade

balance went negative. In spite of the free and porous border, the border price of cereals is higher in Nepal than India, reflecting food shortage in the country. Excluding pulses, import of all the other major food crops increased in the latter years of the period 1970-98. There is steady increase in the net import of vegetables oil as compared to the others. During the first half of the period 1970-98, the export of rice was greater than its import, but after the mid-eighties the export of rice significantly reduced as compared to its import.

Foodgrain Balance

DFAMS/HMGN track records of the 10 principal crops: five food crpos, namely, paddy, maize, wheat, millet and barley; and five cash crops, sugarcane, oilseeds, tobacco, jute and potato. The FAO balance sheet for Nepal looks at food production estimates of these 10 crops. According to this, Nepal became a food deficit country in 199s. The amount of food deficit reached to the tune of 106,548 MT. Per capita availability of edible cereals was 189 kg in 1991, which dropped to 175 kg. in 1997. Forty five out of 75 districts are food deficit (Table 1).

Table 1

Foodgrain Balance By Ecological Zone In Nepal 1996/97

Zone	District	Production (MT)	Requirement (MT)	Balance (MT)	Districts -/+
Mountain	16	179,867	310,090	-130,223	-16/0
Hill	39	1,548,469	1,548,469	-385,277	-26/+13
Terai	20	2,244,251	2,444,251	+408,952	-3/+17
Nepal	75	3,972,587	3,972,587	-106,548	-45/+30

Source : Shakya and Singh, 2000

One of the reasons for the operation of Nepal Food Corporation (NFC) in Nepal is making food available in the remote districts of Nepal. Although food supply by NFC is not sufficient, without its presence life becomes further difficult in many remote districts of Nepal which is evident from long queue waiting for getting a little amount of foodgrain in remote districts of Karnali Trans-Himalayan region. There is evidence which shows that because of the lack of food, every year people die in the remote mountain districts. Diarrhoea and cholera and lack of food claimed death of as many as 350 people in Humla in 1998.

ACCESS TO FOOD

Access to food is governed by entitlements of households. Sources of entitlement are productive capital, non-productive capital, human capital, income and claims. Of all the sources, land is still main source of entitlement in a country like Nepal where more than 80 percent of the population are engaged in agriculture and living mostly in rural parts of the country. The phasewise implementation of Land Reform Act 1964 could not appropriate surplus land above the ceiling and therefore there is still unequal distribution of land. The distribution of assets and income is governed by the socio-economic structure of a country. The deep-rooted structure has created unequal distribution of income and assets in Nepal. Thus, the food access is not that better in the country, unless income and employment opportunities of the people are enhanced.

Overall, 42 percent of the population is below poverty line, with wide differences between regions and areas. The incidence of poverty is 44 percent in rural areas against 23 percent in urban areas. It is 56, 41 and 42 percents in Mountain, Hill and Terai region, respectively.

The per capita income in Nepal was estimated at NRs 7,673 in 1996. This widely differs across the different sub-regions of the country, ranging from NRs 4,195 in Far-western Mountain to 12,103 in Central hills (Table 2). The per capita income in all the five subregions of the mountain falls short of the average income of the country. excluding Central and Western hills and Eastern Terai, the per capita income in all other sub-regions of hills and Terai is less than that of the country. Thus, in terms of economic condition, the Central hill and the eastern Terai excels over the other regions of the country.

Remittance is important source of income for majority of population, particularly those of low-income brackets. About 23 percent of households receive remitances from within and outside the country. Relatively higher proportion of households, 31 percent, from the Western Development region of the country depends on remittances. India is the main source of remittances contributing more than 38 percent of the total amount at the national level. The share of remittances constitutes about 27 percent of average household income. Percentage of wage earner is relatively higher in non-agricultural sector (67%) as compared to the agricultural sector in the hills of Nepal. About 24 percent of households were engaged in non-farm activities such as non-manufacturing, trade and services (Shakya and Singh, 2000).

Table 2

Per Capita Income By Sub-regions, 1996

Sub-region	Per Capita Income (NRs)	Per Capita PPP Income (US$)
Eastern Mountain	6682	1033
Central Mountain	7111	1099
Western Mountain	6952	1075
Mid-Western Mountian	4981	770
Far-Western Mountain	4195	648
Eastern Hill	5774	892
Central Hill	12103	1871
Western Hill	7988	1235
Mid-Western Hill	6220	961
Far Western Hill	5881	909
Eastern Terai	8578	1326
Central Terai	7665	1185
Western Terai	5609	867
Mid-Western Terai	6100	943
Far Western Terai	6863	1061
Nepal	**7673**	**1186**

Source: Nepal South Asia Centre, 1998

UTILISATION OF FOOD

Utilisation of food refers the use of food which a family has access to. It has three dimensions: a) Utilisation of food by the family; b) utilisation of food by the individuals in a family, and c) Health and nutrition status of the individual members of family, with a special focus on women and children as they are more disadvantaged and vulnerable groups.

Utilisation of food by family implies hygiene and housing jconditions for storing, cooking, and preparing food. Utilisation of food by individual depends on food intake of individual members of family. The health and nutritional status of individual members is measured by the prevalence of clinical symptoms among the family members and their anthropometric measurement.

Thus, proper utilisation of food also depends on many factor including housing conditions such as drinking water and sanitation situation among others that determine preparation of food among others; food intake by individuals which depends on quantity and types of food consumed; and conversion of food that leads to decide the health and nutrition status of individuals. Therefore, the incidence of disease,

morbidity, life expectancy and nutritional status all could be proxy indicators reflecting food utilisation.

There is uneven distribution of food among family members. Generally, females are relegated behind males especially in indo-Aryan families. The extended entitlement of household heads and other able bodied workers who are generally male and work outside home, also result into the uneven distribution of food.

In terms of human development, Nepal is the poorest performer in the South Asian region. Crude birth rate decreased from 41 per thousand persons in 1971 to 37 in 1996; and crude death rate from 21 to 12 per thousand persons during the corresponding years. Total fertility rate declined form 5.5 percent in 1971 to 5 percent in 1996. As a result, life expectancy at birth increased from 37 to 57 years during the same period. Some other indicators, which also reflect food utilisation, are analysed at the sub-regional level.

Nutritional Status of Children

There are three anthropometric indices of nutritional status: i) height for age, ii) weight for height, and iii) weight for age. These three indices measure stunting, wasting and underweight reflecting chronic malnutrition, acute malnutrition and general malnutrition, respectively. Anthropometric measurements were performed in Nepal Multiple Indicator Surveillance (NMIS) in 1995 and 1996, and Nepal Family Health survey (NFHS) 1996. Both surveys were designed to provide regional and sub-regional level estimates. Besides, NMIS also provides district level estimates for few districts. While NMIS provides nutritional status of only children aged 6-36 months, 1996 NFHS provides both fo rthe children aged 0-36 months and also women. Therefore, NFHS data has been used here to depict the nutritional status of children and women, who are the disadvantaged populations in Nepal.

Nepal Family Health Survey 1996 estimated stunting 38 percent in eastern development region to 53 percent in far-western development ragion among the children 0-35 months. Overall, the proportion of stunted children stands at 48 percent and wasted children at 11 percent.

Table 3 shows the proportion of children under three years of age classified as malnourished according to each of the three indices by sub-regions. These proportions are expressed below two standard deviations from the median of a reference population. Overall, 48 percent of children are stunted and 11 percent are wasted. The proportion of the underweight children in Nepal is 47 percent. By sub-regions, there is wide differences in three indices.

The proportion of stunted children ranges from 35 percent in eastern terai to 66 percent in western mountain. The proportion ranges from 35 to 45 percent in five sub-regions, from 45 to 55 percent in two sub-regions, and in the rest sub-regions it ranged from 55 to 60 percent. The three sub-

regions where the stunting is at the higher end are western mountain, 65.8 percent, far-western hill, 58.9 percent, and mid-western hill, 56.4 percent. The proportion of stunted children consistently increases, as one moves from east to west in the mountain and hills but not in the terai.

Wasting ranges from seven percent in eastern mountain and western hill to 20 percent in far western hill. In seven out of the 13 sub-regions, it hovers around 11 to 13 percent. The highest proportion of underweight children is measured in western mountain, 67.4 percrnt, and the lowest in eastern mountain 34.3 percent. This indicates that there is wide difference in the proportion of general malnutrition even among the same ecological belt, i.e. mountain region of the country. In the hill it is lowest in the eastern hill and increases as one goes to western hill and ultimately it reaches as high as 65 percent in the far-western hills. However, such a consistent pattern does not hold in case of the terai. The Lowest proportion of underweight children are in the eastern terai, but higher proportion of such children in the middle and western part of the terai rather than mid-west and far-western part of the terai.

In summary, all the three indices of malnutrition increase east to west in the mountain and the hills, but not in the terai. The terai does not show a consistent pattern.

Table 3
Nutritional Status Of Children By Three Anthropometric Indices Of Nutritional Status And By The Eco-Development Regions

Sub-Region	Height-for-age	Weight-for-height	Weight-for-age	No. of Children
Eastern Mountain	44.0	6.7	34.3	55
Central Mountain	53.1	12.8	47.5	100
Western Mountain	65.8	17.6	67.4	114
Eastern Hill	41.9	8.5	37.5	274
Central Hill	44.1	7.5	38.8	446
Western Hill	48.9	6.8	43.3	451
Mid.-Western Hill	56.4	11.2	51.2	295
Far-Western Hill	58.9	19.8	64.6	146
Eastern Terai	35.3	11.6	38.8	436
Central Terai	54.9	11.3	54.2	702
Western Terai	51.6	17.6	54.1	311
Mid.-Western Terai	39.4	11.3	40.8	214
Far-Western Terai	44.0	13.3	45.4	162
Overall	**48.4**	**11.2**	**46.9**	**3,075**

Source : As of the Table 2

Nutritional Status of Mothers

The analysis of nutritional status of mothers is based on women who had a live birth in the three years preceding the survey, and therefore is not

representative of the entire universe of the 15-49 years women. The basic measures used to assess maternal nutrition are height and weight of women and Body Mass Index (BMI), an indicator that combines both height and weight data.

The health of women also depends on height of women, as they have to perform reprductive function. The height below which a woman is considered to be at nutritional risk is in the range of 140-150 centimetres (cm). The mean in the 1996 NFHS was found 150 cm, with 15 percent of women less than 145 cm.

The BMI, which utilises both height and weight and provides a better measure of thinness than weight alone, is defined as weight in kilogram divided by the square of height in metres. For the BMI, a cut-off of 18.5 has been recommended for indicating chronic energy deficiency among non-pregnant women. The mean BMI for women in Nepal is 19.8 One of four women in Nepal falls below the cut-off, indicating that the level of chronic energy deficiency in Nepal is relatively high.

The percentage of women with height below 145 cm is higher in central and western of hills and Terai each, and lower in the rest of the Terai and the hills. The proportion does not diverge much in the east to west of the mountain region. The BMI was found less than 18.5 in six of the 13 sub-regions, viz, all the three regions of the mountain, and from eastern to western hills. But in all of the five regions of the Terai it is above the cut-off showing better situation of women in Terai than in the hills or the mountain.

Table 4
Maternal Nutritional Status By Eco-Development Region

Sub-Region	Height			Body-Mass-Index (BMI)		
Eastern Mountain	150.4	15.3	57	21.2	12.2	51
Central Mountain	149.9	14.5	100	20.4	13.1	81
Western Mountain	150.4	14.6	130	19.9	14.6	109
Eastern Hill	149.9	15.4	265	20.7	12.6	228
Central Hill	150.0	16.6	447	20.8	12.9	396
Western Hill	150.1	15.8	446	20.9	15.6	377
Mid-Western Hill	151.1	13.0	297	20.0	21.3	247
Far Western Hill	151.3	10.8	154	19.4	28.1	130
Eastern Terai	150.7	11.1	458	19.0	46.4	410
Central Terai	150.2	17.0	708	18.8	47.3	595
Western Terai	150.1	17.0	302	19.3	34.2	262
Mid-Western Terai	151.1	12.5	226	20.0	20.7	196
Far Western Terai	151.2	12.5	157	19.4	36.7	136
Overall	**150.4**	**14.8**	**3,746**	**19.8**		**3,217**

Source : As of the Table 2

Access to Water and Health Services

Overall, only two thirds of the population in Nepal have access to safe water. The back of access to safe water varies widely across regions, ranging from 12 percent in Far Western Terai to as high as 73 percent in the Mid-Western hills. Lack of access to safe water is of serious concern in Western Mountain, and Eastern and Mid-Western hills as compared to the other sub-regions of the country. Accessibility of safe water is higher in Terai as compared to the hills and the mountain, and again within Terai, the situation is better in the Central, Western and Far Western Terai.

Table 5
Proportion Of Population Without Access to Safe Water And Health Service

Sub-Region	Population Without Access to	
	Safe Water percent	Access to Health Service percent
Eastern Mountain	28.7	66.8
Central Mountain	33.3	38.2
Western Mountain	59.5	81.0
Eastern Hill	59.5	84.4
Central Hill	27.9	39.1
Western Hill	35.7	69.1
Mid-Western Hill	73.1	49.9
Far-Western Hill	43.2	72.7
Eastern Terai	26.5	29.8
Central Terai	18.8	74.0
Western Terai	15.1	59.0
Mid-Western Terai	31.7	57.5
Far-Western Terai	11.9	71.4
Nepal	33.2	58.7

Note: Due to data inadequacies, the mountain and hills have been aggregated together in some cases.* Estimated from the growth rate of the Western Development Region.

Source : Nepal South Asia Centre, 1998

Coming to the access to health services, the situation is worse in most of the regions. The only sub-regions where access to health services is better are in Central Mountain and hills, and Eastern Terai. The proportion of population without access to health services ranges from 30 percent in Eastern Terai to as high as 84 percent in the Eastern hills.

CONCLUSION

Compared to population growth, there is not significant increase in agricultural productivity. Whatever increase in the agricultural production has occurred is primarily the result of acreage expansion rather than productivity gains. Agriculture exports had a large share in the total foreign exchange earnings until 1970s. These began to decline and by 1990s, Nepal's trade balance went negative. Excluding pulses, the import of all other major food crops increased in the latter years of the period 1970-98.

Poor performance of agriculture sector and occurrence of natural hazards like floods, droughts and landslides have contributed to reduced food availability. Although there is some increase in the cereal production after mid-eighties, there is no decrease in the import of rice, and the country turned to food deficit. This is mainly because of the rapid growth of population. The amount of food deficit reached to the tune of 106,548 MT in 1996/97. Per capita availability of edible cereal was 189 kg in 1991 which dropped to 175 kg in 1997. Out of 75 districts, 45 districts are food deficit.

Lack of employment and income earning opportunities is the major problem constraining the capacity of people for the improved economic access to food. Per capita income in Nepal was estimated at NRs 7,673 in 1996, ranging from NRs 4,981 in Mid-West Mountain to 12,103 in Central Hill. The poverty rate is 56, 41 and 42 percent in mountain, hill and Terai regions, respectively. This together with the lack of physical availability of food in the mountain and remote districts has resulted into famine and starvation in those districts. In many parts of Nepal, nutritional problems are more closely associalted with the shortage of income than to the shortage of the food.

Remittances are important source of income for majority of population, particularly for those of low income brackets. Wage earners are relatively higher in non-agriculture sector as compared to agriculture sector in the hills of Nepal. The contribution of agriculture to total income is decreasing, whereas that of migration is increasing. But this situation differs by districts.

Around 50 percrnt of children are underweight. The proportion of underweight children increases as one moves from east to west part of mountain and hill, but this does not hold in Terai. In Terai, the proportioan is higher in the mid and west parts. The nutritional status of women in Terai is better than that of the hill and mountain. Overall, one of the four women has chronic energy deficiency as measured by BMI in NFHS, 1996. Lack of proper utilisation of food is evident in family because of the gender differences deriving from the differences between the men and women in entitlements and opportunities, and because of the micronutrient deficiencies.

The important natural disasters in Nepal are floods and landslides, and drought which cause a significan loss of life and properties. Social,

economic and political risks have also been in rising trend. Diarrhoea, ARI and worms are common in Nepal. Their effect is higher on the poor families, children and women, and they claim death of children and infants every year.

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