



GOVERNMENT OF NEPAL
National Planning Commission



UN Food Systems Summit 2021
**"Nepal towards an equitable, resilient and sustainable
food system"**

**Nepal's Food System Transformation:
Context, Pathways and Actions**

**(Outcomes of the National and Provincial Food Systems Dialogues
as a part of the UN Food Systems Summit 2021)**

**National Planning Commission
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Introduction

Overview of Food System and UN Food System Summit 2021

What is food system?

Food systems (FS) encompass the entire range of actors and their interlinked value-adding activities involved in the production, aggregation, processing, distribution, consumption, and disposal of food products that originate from agriculture, forestry or fisheries, and parts of the broader economic, societal, and natural environments in which they are embedded. It is composed of many sub-systems (e.g., input supply, farming system, output marketing etc.) and interacts with other key systems (e.g., energy system, trade system, health system, etc.). The food systems at different scale (global, national, and local) are extremely complex and dynamic, evolving over time.

Conceptual frame

Food systems are multifaceted and complex involving sociocultural, economic, and environmental aspects (e.g., farming, food access and equity, food sovereignty). They involve multiple actors (food producers, food-chain actors, and consumers) operating within dynamic and interactive food environments, with many mechanisms at work across multiple scales and levels. Food systems include all elements and activities related to the production, processing, distribution, preparation and consumption of food, the market and institutional networks for their governance, and the socio-economic and environmental outcomes of these activities.

Figure 1 below shows that the food system outcomes are influenced by the decisions of several stakeholders that operate at different levels of the food systems. The dynamics of food systems transformations can then be understood from the interactions between these stakeholders and the (positive or negative) feedbacks that are generated at different levels of the food system. Such interactions may result conflicting interests, power asymmetries and possible adverse effects.

Smallholder producers are principal actors as a producer and consumer of food in developing economies. Within rural settings, access and distribution of food is changing at fast pace due to climate change, urbanization, and evolving market linkages. Furthermore, the input suppliers, marketing agents, traders, big enterprises, and processors are important actors in the food value chain as they share a major part of the rent so generated. Public policies and institutional regimes that shape the food environment can be helpful to provide protection and to support gradual adjustment of rural livelihoods.

The fundamental elements of food systems that potentially determine an individual's diet include consumer behaviour, the food environment, and food value chains. Consumer behaviour depends on their individual characteristics in addition to and in interaction with the characteristics of their food environment. At the individual level, a range of biological, demographic, psychological and situational determinants ranging from taste preferences to habits and cultural issues related to food choice (Symmank et al., 2017). In a broader sense, the food system affects diets, nutrition, and health outcomes of populations. It is important to position the food system to provide safe and healthy diets and support human health in a way that is environmentally sustainable and resilient to climate change, as well as other disruptions and shocks.

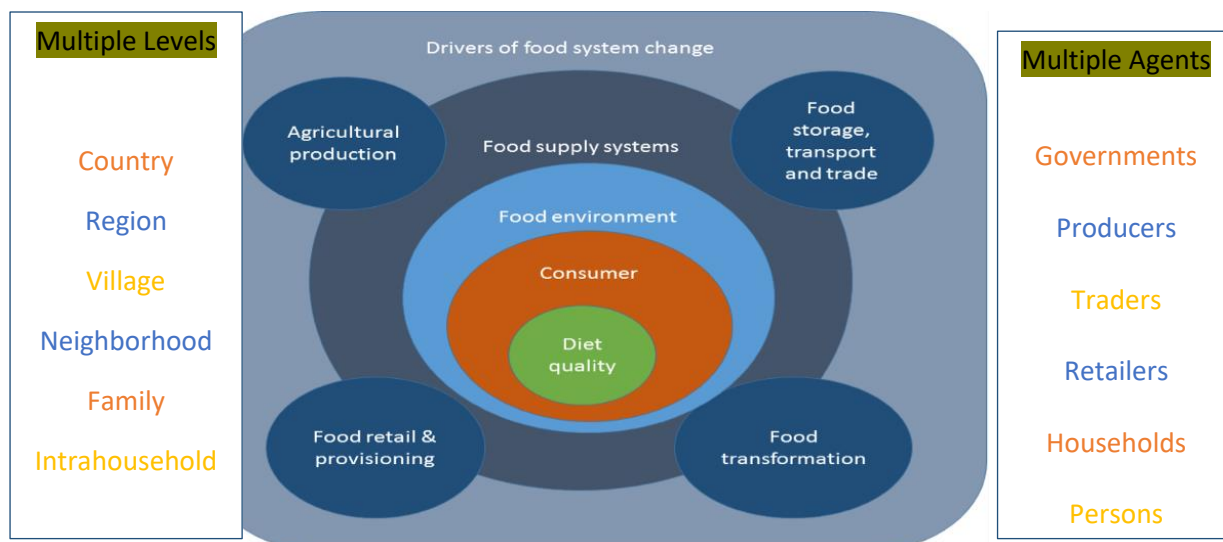


Figure 1. Food system dynamics

Brief description of key components of food system

The key components of the Food system include Food Environment, Food Supply Chain and Household Utilization (Consumption) of Food. The food environment includes both physical and communication infrastructures, the (public and private) institutional regimes that provide guidance to food production, market, and distribution (like grades and standards), as well as the governance framework that guides the quality, safety, and access of food through formal and informal markets.

The food supply chain encompasses all activities that move food from production to consumption, including production, aggregation, storage, distribution, processing, packaging, retailing, and marketing. The decisions made by the many actors at any stage of this chain have implications for other stages. They influence the types of food available and accessible, as well as the way they are produced and consumed.

Consumer behaviour reflects the choices made by consumers based on their food culture and accessibility (physical & economical) to food, at household or individual levels, on what food to acquire, store, prepare and eat, and on the allocation of food within the household (including gender repartition, feeding of children). Consumer behaviour is influenced by personal preferences determined by taste, convenience, culture, and other factors like costs of food. However, consumer behaviour is also shaped by the existing food environment.

Collective consumer behavior may be a driver in influencing the private sector to improve the healthiness and affordability of the foods it produces and markets, and the environmental footprints of those foods.

The responses to changes in the interactions between food system components are likely to vary for different types of food systems. These responses depend on several structural features of the food environment such as natural (biophysical conditions), human-made (physical infrastructure), and market (formal/informal).

These three components of food systems impact consumers' capacity to adopt sustainable diets that are: protective and respectful of biodiversity and ecosystems; culturally acceptable; accessible; economically fair and affordable; and nutritionally adequate, safe, and healthy, while optimizing natural and human resources. A wide variety of food systems and food environments can exist or co-exist at local, national, regional, and global levels.

Types of food system

The food system can be of different types depending upon the criteria used to classify. It can be classified:

1. Based on the area coverage or spatial scale: It can be local, national, regional, and global.
2. Based on the contexts such as rural and urban.
3. Based on food supply chains and the food environment such as traditional, mixed, and modern.

Global food system

A global food system conjures images of food supply chains stretching around the world. Global food systems produce a massive amount of food, and the products' movement and consumption cross the borders. Global food and agricultural production have increased significantly in the recent decades which is stimulated by a combination of population and economic growth along with technological and cultural shifts in production practices. Because of the increase in population, income, and urbanization, there has been an overall increase in food demand. Furthermore, there has been an inclination towards readily available and ultra-processed foods which are mostly less healthy.

Intensification, consolidation, and specialization are some of the large-scale behavioral trends inherent to the food system. Intensive practices dominate the system as a whole and a small number of actors in the fields of production, processing, and retail control most of the food system. Loopholes in trade agreements are widely abused by more powerful nations, resulting in unfair competition for developing countries, ultimately manufacturing dependence, and eroding local food security.

Recent policy shift towards producing non-food crops, like biofuels and biomaterials, are leading to conversion of the land and other base resources, resulting in less availability of these resources for food production. Funding for agricultural research and development is mostly available in higher-income nations, leaving lower-income nations behind. Research and development efforts have been focused on enhancing conventional production methods, with very little funding allocated to the development of sustainable agricultural technologies and practices (Metabolic, 2017).

Current issues

At present, the global food systems face a triple challenge of providing food security and nutrition to a growing population, providing livelihoods to those along the food supply chain, and contributing to environmental sustainability. It is estimated that more than 690 million people are suffering from hunger which accounts 8.9 percent of the global population. Similarly, about 2 billion people do not have regular access to sufficient, safe, and nutritious food, about 1.9 billion adults are overweight while 462 million are underweight (FAO, 2020).

In addition to the population growth, the growing competition and scarcity of land, water and energy for food production are also affecting our ability to produce food. Furthermore, the global food system is greatly impacted by the climate change, biodiversity loss, frequent occurrence of anthropogenic and natural disasters and food price rise. Moreover, Nepalese agricultural system is being impacted with the imports and food dumping and it has yet to be alignment with the global, regional, and bilateral trade agreements. In one hand, Nepalese production system is largely dominated by smallholders and feminized which is yet to be competitive due to less incentives to the producers and workers associated in agricultural sector.

The recent Covid-19 pandemic has threatened the livelihoods of people working on 570 million farms worldwide and along other stages of the food supply chain. There is a significant damage on the environment from the present food production system. Around 80% of all threatened terrestrial bird and mammal species are in danger because of habitat loss due to agricultural expansion; food production (including pre-production and post-production activities) accounts for 21-37% of anthropogenic greenhouse gas emissions. The exiting food systems are responsible for 70 per cent of the water extracted from nature and cause 60 per cent of biodiversity loss (OECD, 2020). The present food systems have clearly been successful at producing low-cost calories, that have supported a fast-growing and more urbanized population. However, the gains in productivity and low-cost calories have not improved access to healthy diets as it remained costly and unaffordable for billions of people.

Ideal food system

Food systems should provide basic sustenance in terms of meeting' minimum caloric needs of the people and affect nutrition positively, through crop health, dietary diversity, and impacts on human health and the environment. Food systems should also support livelihoods for a sizable share of the global population, through agricultural labour and nonfarm jobs in other segments of the food value chain. The income generated from these jobs can be used to purchase a wide range of healthy foods, spend for education, health services and more. At the macro level, food systems support local and national economies, shaped in part by governance, trade, and investment at the global level (IFPRI, 2020). An Ideal Food Systems would be nutrition-health-and safety-driven, productive, and efficient (and thus able to deliver affordable food), environmentally sustainable and climate smart, and inclusive (IFPRI, 2021).

Expectations from the food systems

- Supporting livelihoods of the millions of small producers and those involved in value chains.
- Elimination/reduction of hunger and malnutrition.
- Access to safe and nutritious food for all the population.
- Promoting and creating demand for healthy and sustainable diets and reducing food loss and waste.
- Building a more sustainable, resilient, equitable and inclusive food system.

Overview of Nepalese food system

Food System, a national perspective

The agriculture sector contributes 27% to GDP and employs two-third of the population in which over 70% of the labour force are of women and enjoys a diverse agro-ecological zone. Agricultural land is 28% of total land (21% is cultivated) with an average land holding size of 0.68 ha. Small holdings (less than 0.5 ha) constitute 53 percent. Fragmented land holdings, land abandonment and scattered production are the key features. Women land ownership is 19% in Nepal. Food system is directly related with caste/ethnicity and their culture. Production of diverse food crops, horticultural crops, industrial crops, livestock is common.

Nepal's Global Hunger Index score has reduced from 37.4 to 19.5 between 2000 and 2020 and ranks at 73rd position globally in Global Hunger Index (GHI) out of 135 countries assessed in 2019. In Nepal, the food secure households constitute 48.2% whereas 10% of the households are severely food insecure. About 4.6 million people are still food-insecure, with 20 percent of households mildly food-insecure, 22 percent moderately food-insecure, and 10 percent severely food insecure. The volatility of food production has increased in recent years, with climate shocks, disasters, resource conflicts, pandemics (COVID-19), disease and pest outbreaks. The Nepal Fill Nutrient Gap (FNG) analysis found that nutritious diet for a household costs Rs 348 while diet that only meets energy needs costs about Rs 141 making the cost of a nutritious diet more than twice as expensive as a diet that only meets energy needs. About 55 percent households spend less on food than the Cost of Recommended Diet. About 32% of the children (< 5 years age) are stunted. Nepal is one of the most climate vulnerable countries as per the report of Global Climate Risk Index (2020) which ranked Nepal as the 9th most climate vulnerable country in 2018. In Nepal, 49 districts are prone to floods and/or landslides, 23 districts to wildfires. Climate induced disasters have a significant impact on national economic and social development of the country with direct cost of these events equivalent to 1.5–2% of current GDP/year. NMICS 2019 shows that 60 percent of children 6-23 months of age are not consuming diets with adequate diversity to meet all their nutritional requirements. The rate of exclusive breastfeeding for infants (0-6 months) has declined from 66 percent in 2016 (NDHS) to 62 percent in 2019. Since breastmilk is a baby's first food, efforts to protect, promote and support breastfeeding under the broader scope of the food system transformation should be a priority.

Ecological perspective (Mountain, Hill and Terai)

The mountain region accounts for 35% of the total land area and about 7% of the total population. From the availability point of view, terai region is food surplus whereas mountains and hills are not. The per capita food grain availability in the mountains (in 2018) was 204 kg. The level of food insecurity is high in the mountains. Nepal Demographic and Health Survey-NDHS (MOH et al.,2016) shows that 38.4 percent households were food secure whereas about 14 percent were severely food insecure. The hill region accounts 42% of the total land area and 43% of the total population. The per capita food grain availability in the hills (in 2018) was 201 kg. NDHS shows that 46.8 percent households were food secure whereas 10 percent were severely food insecure.

The Terai region covers 23% of land area and accounts for about 50% of total population. The per capita food grain availability in the terai (in 2018) was 242 kg. NDHS shows that 51 percent households were food secure whereas 9.2 percent were severely food insecure.

Province-wise issues in the food system (specific to every key chain from production to consumption)

In terms of per capita food grains availability for 2018, it was the highest in Province 1 (306.1 kg) whereas it was the lowest in Bagmati province (158.7). The level of per capita availability in Karnali and Sudurpaschim province were 229 kg and 245.5 kg, respectively. The districts in Karnali and Sudurpaschim province are vulnerable and poor in terms of food security due to low productivity and inaccessibility. Looking at district level food grain production (in terms of the district level food self-sufficiency), all the districts of previous Karnali zone (5) and Rukum west were food insecure in Karnali province. In case of Sudurpaschim, 6 districts out of 9 were food insecure in 2018.

Looking at the household's level (MOH et. al., 2016), the percentage of the households with food secure were the highest in Gandaki Province (56%), followed by Bagmati (55%), Province 1(52.6%), Lumbini (48.4%) and Province 2 (43.1%). This indicator was at the bottom for Sudurpaschim (37.7%) and Karnali province (22.5%). The percentage of severely food insecure households was the highest in Karnali (17.5%) followed by Sudurpaschim (13%) and Province 2(10.7%).

Considering the child nutrition, the level of stunting and the wasting was the highest for Karnali province (47.8% and 17.6% respectively) whereas it was the lowest in Gandaki for stunting (22.6%) and Bagmati for wasting (4.7%).

Rural food system and urban food system (specific to every key chain from production to consumption)

Rapid urbanization and increase in income of the of the people has increased the demand for nutritious food. But the cost of recommended diet differs by rural urban settings. The cost of recommended diet (CORD) is higher in urban areas than in rural areas by 20 percent. The urban-rural CORD difference is 58 % for fruits and 44% for vegetables. The percentage of households spending less than CORD is 75% in urban areas whereas it is 50% in rural areas. This is because prices are typically higher in urban areas than in rural areas. In Nepal, the non-affordability in urban areas is still higher than in rural areas, suggesting that food expenses are anyway more or less similar between urban and rural areas (World Bank, 2021).

Gender Equality and Social Inclusion in agriculture and food system

Nepalese agriculture mostly being subsistence in nature, majority are involved in family farming and of small holders. Since over 70% of farm workers are of women, their power sharing in production resources and leadership in different institutional architecture is under-represented. The existing gender disparities, social and cultural discriminatory practices also influence inequity in terms of access to production resource governance, access to employment and incomes, inclusive leadership, and equitable access to food by all. Women, smallholders, and poor are further pushed to risks of vulnerabilities in securing nutritious and adequate food. Most often, these are the groups disproportionately impacted by natural disasters and pandemics like COVID-19. Due to this, they need of strong institutionalized response mechanisms, which is not in place for the moment.

Key drivers and opportunities shaping Nepalese food system

Key challenges of Nepalese Food System:

- Mostly the existence of subsistence farming system but commercial/semi-commercial in certain pockets/areas.
- Low levels of production and productivity and high level of post-production loss.
- Food habit change - increasing trend of the consumption of processed food, abandoning local food culture
- Weak climate resilience, frequent climatic shocks and damages, low capacity for disaster preparedness and anticipatory action.
- Rapidly depleting ground water resources in response to potentially unsustainable public demand by extracting water faster than aquifers can recharge and due to climate change effects.
- Limited agricultural infrastructures such as storage, markets and cold chains and low level of mechanization.
- High costs of production, weak market linkages and distribution system leading to high prices, ultimately losing competition with neighbouring countries in our own markets.
- Inadequate storage facilities for food buffer stocking and poor distribution system due to inadequate management capacity, among others.
- Decreasing food diversity; low awareness on the need to address food and nutrition security.
- Poor level of awareness and unavailability of appropriate composition of nutritive food menu that can be used by the people.
- Inadequate coherence to translate the constitutional and policy provisions on food sovereignty and food rights into action (such as delay in the implementation of Right to Food and Food Sovereignty Act).
- Low investment on gender, geography, and market responsive research.
- Weak triangle of agricultural research-extension-education.
- Poor collaboration and cooperation among the responsible institutions.

Key Drivers

Environmental drivers: Land abandonment and Climate Change effect at different value chains, Covid-19 pandemic.

Demographic drivers: Population growth, rapid urbanization, conversion of agricultural land for non-agricultural purposes, land fragmentation; migration of agricultural labourers, particularly men.

Technological drivers: Small bundle of technologies available for diverse ecosystems; cultivation/commercialization of limited crops/commodities reducing crop diversity; low research and development effort to consolidate local crops production / food culture.

Socio-economic drivers: Changes in eating habits-increasing consumption of processed food, increased income, outmigration of people for jobs, reduced attraction of youths in agriculture, increasing influence on mothers' choice to breastfeed by infant formula marketing and promotion.

Physical drivers: Inadequate physical infrastructures for value adding and connecting to markets; limited/costly accessibility due to difficult terrain in hills and mountains for transportation of food or agriculture inputs/outputs.

Cultural drivers: food traditions, women’s empowerment, inheritance along male line putting women at disadvantaged position for land ownership and decision making.

Opportunities

- Constitutional, policy and legal base for food rights and food sovereignty
- Potential to increase production and productivity of major crops/commodities as indicated by high yield-gap at the farm level and research station for major commodities.
- Harnessing the rich biophysical, cultural, and biological diversity by the promotion of locally available nutritious foods/commodities.
- Potential to promote collaboration and partnership among the public, private, and community organizations and NGOs.
- Lowering production costs by the adoption of available sustainable technologies and distribution costs by rapid development of road infrastructures and networks.
- Increased role of women in household decision making, including in agriculture production and food behavior, as more and more women are de-facto household decision maker due to long absence of men (due to migration).
- Potential to increase resources and investment in food system strengthening due to devolution of power and authority to local governments creating opportunity for localized and customized actions to harness diverse agro-ecological niches.
- Greater integration of national food system to regional and global systems, opening opportunity for export of specialty commodities with comparative advantage – such as coffee, tea, organic products, cardamon for increasing income of rural people.
- Climatic difference between plains and hills contributes in the production of variety of foods to balance in nutritious value.
- Promotion of high value crops and commodities by creating investment-friendly environment for private sector through adopting different policies and strategies by all tiers of governments.

UN Food System Summit 2021

[The Food Systems Summit](#)

Food systems touch every aspect of human existence and affect the health of our bodies, environment, economies, and culture. They have the potential to nurture human health and support environmental sustainability. However, food systems are currently not meeting the healthy food and nutritional requirement of growing population in the changing climate and market needs. Our food system is under pressure from natural resource degradation, climate crisis, conflict, outmigration of youths and feminization of agricultural tasks, privatization of production process and resources and inequality. A failed food system threatens education, health, and economy as well as human rights, peace, and security. Therefore “Transforming food systems is crucial for delivering all the 2030 UN Sustainable Development Goals.”

As called by the United Nations Secretary-General, Food Systems Summit will take place in September 2021. The summit is underpinned by an inclusive engagement process to deliver progress on all 17 UN Sustainable Development Goals (SDGs). In preparation for this historic global summit, a diverse range of stakeholders from all Member States — from Government to Members of Parliament, from youth

activists to indigenous leaders, from smallholder farmers to private sectors, civil societies, scientists, and CEOs – are invited to identify the most powerful ways to make food systems stronger and more equitable; ultimately driving progress on all of the SDGs. In the run up to the UN Secretary-General’s Food Systems Summit it is expected that many UN Member States will focus on how their national food systems can, in the coming decade, align with the 2030 Agenda for Sustainable Development and the Sustainable Development Goals.

Purpose, objectives and expected outcomes

The Summit will release bold new actions, innovative solutions, and strategies to transform our food systems. The summit aims to:

1. Generate significant action and measurable progress towards the 2030 Agenda for Sustainable Development and issue a call for action at all levels of the food system.
2. Raise awareness and elevate public discussion about how reforming food systems can help us all to achieve the SDGs by implementing reforms that are good for people and the planet.
3. Develop principles to guide governments and other stakeholders looking to leverage their food systems to support the SDGs.
4. Create a system of follow-up and review to ensure that the Summit’s outcomes continue to drive new actions and progress.

Food System Dialogues in Nepal

Purpose and timeline

As a part of different activities towards food system summit, Nepal is preparing a country background paper to reflect national ambitions in UN Food Summit in September 2021. In this process, Nepal has organized 3 national level and 7 provincial level food system dialogues by involving diverse stakeholders. Similarly, independent dialogues were also organized by Peasants’ coalition, youths, peoples’ organizations and development partners. These dialogues aim to identify actions across the system together with potential synergies and trade-offs. They also provide an inclusive and supportive venue for debate, collaboration, consensus-building, and shared commitment making. In addition, these dialogues in the context of federalized governance and constitutional provision of food sovereignty, right to food and food security are a unique opportunity to develop common understanding and prepare for federalized, inclusive, and sustainable food system. The specific objectives of the dialogue are:

- To raise awareness and elevate public discussion on 2021 UN Food System Summit Agenda.
- To examine current situation and identify key aspects of Nepalese Food Systems that need to be transformed.
- To identify actions, drivers and explore options for national food systems to be inclusive, sustainable, and resilient.
- To identify pathways for transforming national food system towards achieving 2030 UN Sustainable Development Goals.

Expected Outcome

The main outcome of food system dialogues is to enable national governments and stakeholders to engage in the issue of constructing sustainable food systems and reflecting national ambitions in UN Food Summit in September 2021. The specific expected outcomes are outlined below.

1. Participants across different stakeholders from local, provincial, and federal level engaged in discussion, identifying their contribution and where possible making commitment and taking accountability.
2. National Food Systems examined in terms of their potential drivers and vulnerabilities as well as actions and opportunities for transformation.
3. Emerging issues identified on which there is consensus and areas where major disagreements exist.
4. A national pathway towards a sustainable food system outlining the practices, policies, actions, partnerships, and commitments shaped for Nepal with the support from a broad range of stakeholders.

Overall agenda and themes

Theme: **“Nepal towards an equitable, resilient and sustainable food system”**

Action Track 1: Ensure access to safe and Nutritious food for all

This Action Track aims to end hunger and all forms of malnutrition and reduce the incidence of diet-related non-communicable disease (NCD). Achieving this goal requires delivering on the right to food to ensure that all people always have access to enough affordable and safe food. This in turn entails a need to increase the availability of safe, nutritious, and diverse diet, making food more affordable and reducing inequities in food access.

Context in Nepal:

Food Security & Nutrition in Nepal

Food Security

When we look at food security, it is essential to consider its components- availability, accessibility, utilization, and stability. The availability is in terms of domestic production of food and imports. The production and productivity of major crops between the year 1999-2018 is presented in Table 1. The area growth is significant for potato and vegetables. However, this is not seen in case of food grains. The change in area for staple food crops is negligible indicating that the only alternative to increase production is by enhancing yield. It is notable that the yield of most of the staple food crops in Nepal is very low compared with our neighboring countries and at global level.

Table 1. Annual compound growth rate of area, production, and yield of major crops (percent)

Description	Area	Production	Yield
Paddy	-0.36	1.36	1.73
Maize	0.76	3.36	2.60
Wheat	0.73	2.88	2.15
Potato	2.67	4.84	2.17

Vegetables	3.78	5.65	1.87
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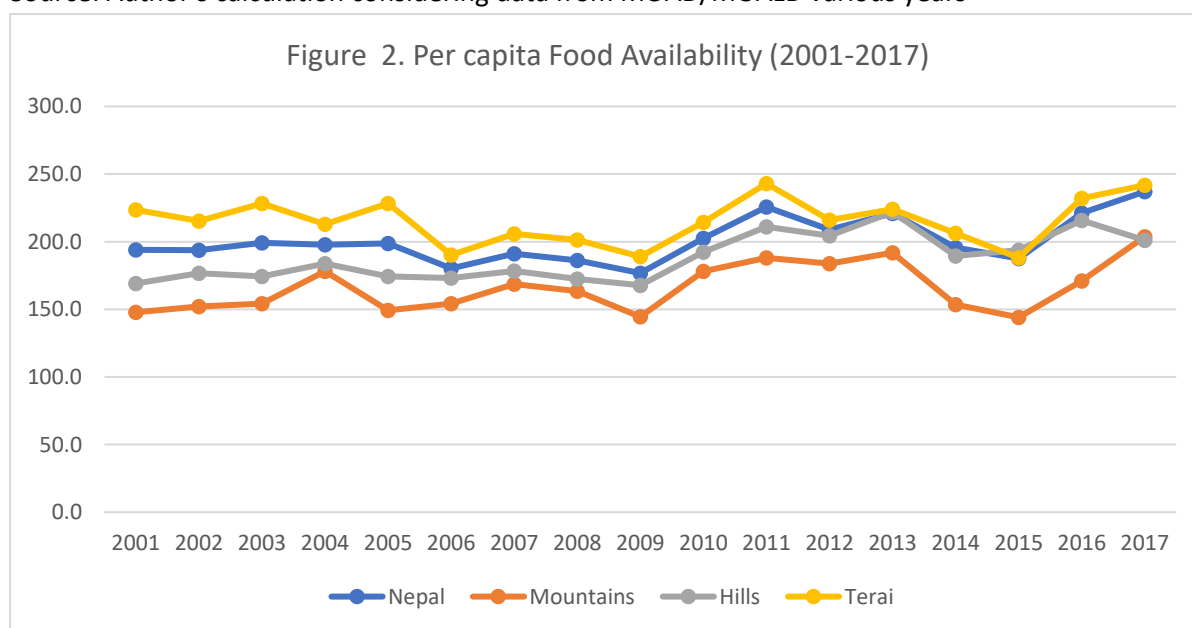
Source: Author's calculation considering data from MOAD/MOALD various years

The production growth of livestock product and fish is presented in Table 2. It shows that the growth of chicken was the highest followed by fish and egg, the growth in production of other meats and milk products remained between 3-4 percent per annum.

Table 2. Annual compound growth rate of production of products and fish (percent)

Commodities	Growth (1999-2018)
Milk	3.54
Goat Meat	3.80
Chicken	10.19
Mutton	3.58
Total Meat	3.55
Egg	6.08
Fish (pond culture)	8.08

Source: Author's calculation considering data from MOAD/MOALD various years



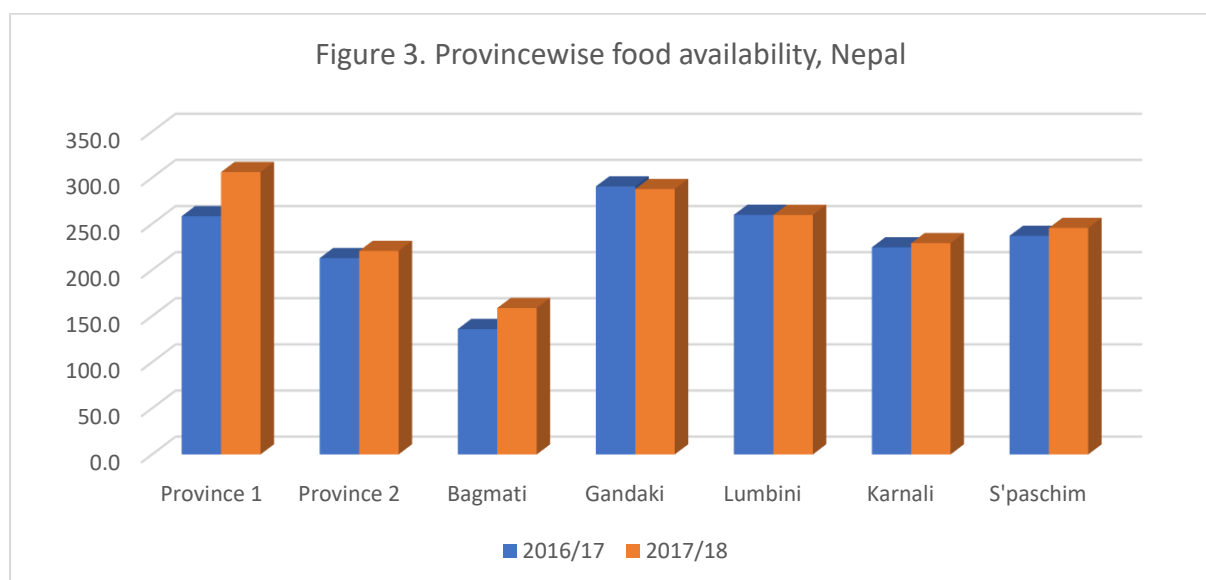
In terms of per capita food grains availability, this is at increasing trend. It was 194 kg in 2001/02 which increased to 237 kg in 2017/18 (MoALD). However, this indicator is quite below the national level in the mountains and hills (Figure 2).

The province wise edible food production data is available only for two years. There has not been a significant difference in availability between two years except in Province 1, 2 and Bagmati. The per capita availability in Bagmati province is lowest because it is the capital province where overall production is low with highest population density in Kathmandu valley (Figure 3).

While food security in Nepal has improved in recent years, 4.6 million people are food-insecure, with 20 percent of households mildly food-insecure, 22 percent moderately food-insecure, and 10 percent

severely food-insecure (MOH et al., 2017). Overall, households in rural areas of the country—where food prices tend to be higher - are more likely to be food-insecure than people living in urban areas. It is revealed that the percentage of the households with severely food insecure is more in rural areas (11.7%) than in urban areas (8.8%). In terms of the food insecurity at province level, the percentage of households facing severe food insecurity is the highest in Karnali (17.5%) followed by Sudurpaschim (13%) and province 2 (10.7%). It is surprising to know that although Province 2 produces surplus edible food grains, more than 30 percent of the households fall under moderately to severely food insecure category. This may be due to high population density in province 2 and the unaffordability of the poor households to purchase foods from the markets. This is also due to traditional feudalistic culture of ownership of land with skewed distribution where large landowners in the province sell food grains across country whereas the poor and landless people cannot afford accessing enough food.

The determinants of the household food security shows that the male-headed household, household members with both agricultural and allied occupation, age of the household head, percentage of irrigated area, number of livestock owned by the household, and owner operator were positively related while the household size and time taken to reach the nearest market were negatively related (Joshi & Joshi, 2017). In the eastern region of Nepal (Province 1), it was revealed that the educational attainment level of household’s head positively contributed to enhancing the situation of food household security, the female-headed households were more food insecure compared to male headed households, although they play major role in household food security. Similarly, the households with bigger size of land holding, nearness to road heads and markets, and the members having off-farm and non-farm occupation contributed positively to food security whereas bigger household size contributed negatively to the food security (Joshi & Joshi, 2016).



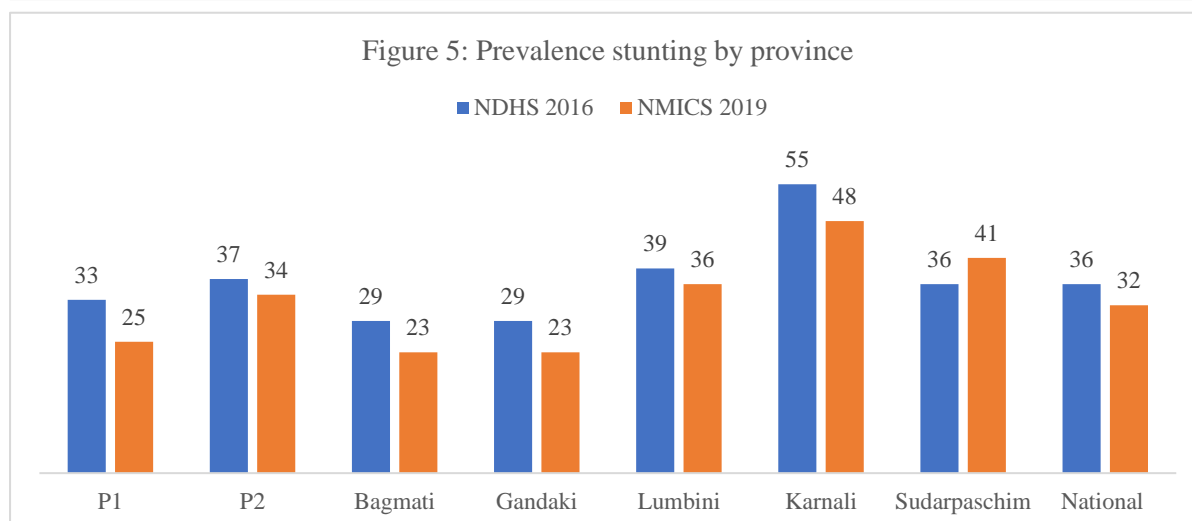
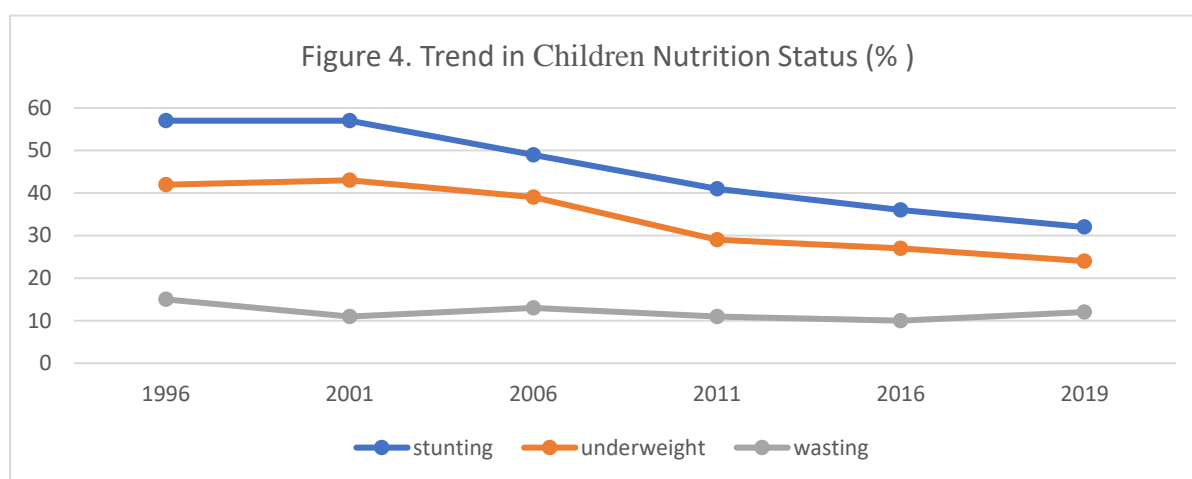
The production of major food grains has the coefficient of variation ranging from 11-20 percent during recent decades, indicating that the scenario was not favourable in terms of stability in production. Factors contributing to these annual variations are the inadequacy of irrigation infrastructure and its ineffective management, ineffective service delivery, and increased incidence of natural calamities such as drought and flood. In Nepal, the cereal import dependency has been rising, while Nepal’s capacity to import food (in terms of export earnings from goods) has been falling. The volatility of food

production has increased in recent years, with climate shocks increasingly seen as the main reason (Joshi, 2018).

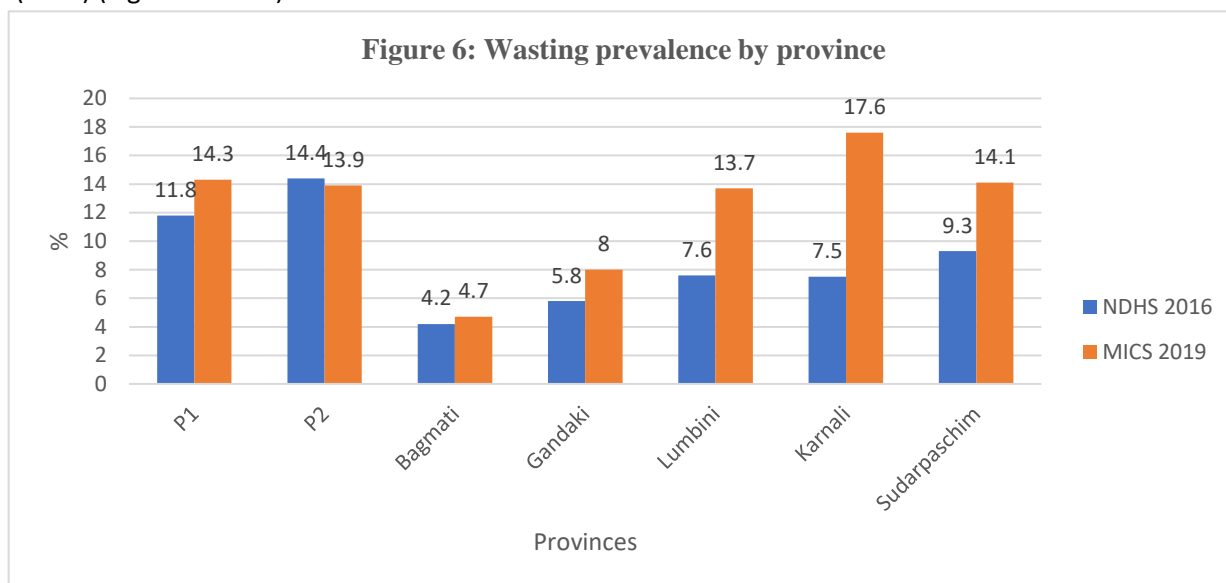
Nutrition

The Nepalese diet relies heavily on energy rich staple foods. A higher share of energy from staples indicates a low diet quality because it has a small amount of bioavailable protein and micronutrients. This leaves those consuming large amounts of staples compared to other foods (like fruits, vegetables, and proteins) vulnerable to protein and micronutrient deficiencies.

Although malnutrition remains a concern, Nepal has made progress in terms of child nutrition. The percentage of young children under 5 years of age for stunting was 57 percent in 1996 which reduced to 32 percent in 2019. This is almost one percent reduction per year. During this period, the percentage of underweight children declined from 42 to 24 and wasting from 15 to 12 percent (Figure 4). Nepal’s under-five mortality rate (per thousand) has declined from 118 in 1996 and 61 in 2006 to 28 in 2019 (NPC & UNICEF, 2019).



By province, the level of stunting and the wasting was the highest for Karnali province (47.8% and 17.6% respectively) whereas it was the lowest in Gandaki for stunting (22.6%) and Bagmati for wasting (4.7%) (Figure 5 and 6).



The Minimum Dietary Diversity for the women between the age of 15-49 years shows that in Nepal, only 35 percent women reported consuming food from the “meat, poultry and fish” group while 50 percent of women achieved minimum dietary diversity (FAO, 2020). It shows that the women from urban households and those from richer families have better dietary diversity than women from rural households and poorer families.

Pregnant and lactating women (PLW) also suffer from malnutrition, as well as micronutrient deficiencies. Approximately 1.4 million PLW are malnourished, and 48 percent suffer from anaemia (WFP, Quoted by USAID, 2019). The prevalence of anaemia among children under age 5 has increased from 46% in 2011 to 53% in 2016. Province 2 has the highest prevalence of anaemia (59%), and Bagmati province has the lowest prevalence (43%). A mother's education is associated with the anaemia status of her children. It is revealed that 57% of children of mothers with no education are anaemic compared with 44% of children of mothers with SLC and a higher level of education (MOH et al., 2017).

Data on the adequacy of diets for children 6-23 months also shows that 60 percent are not consuming diets with the required diversity to meet growth and development requirements. Nor are children consuming enough food or eating often enough throughout the day to meet their nutritional requirements. Low dietary diversity among children 6-23 months is due to a combination of factors including food insecurity, inequitable intra-household food distribution, cultural and social beliefs and the growing availability and influence of marketing of processed non-nutritious foods to children.

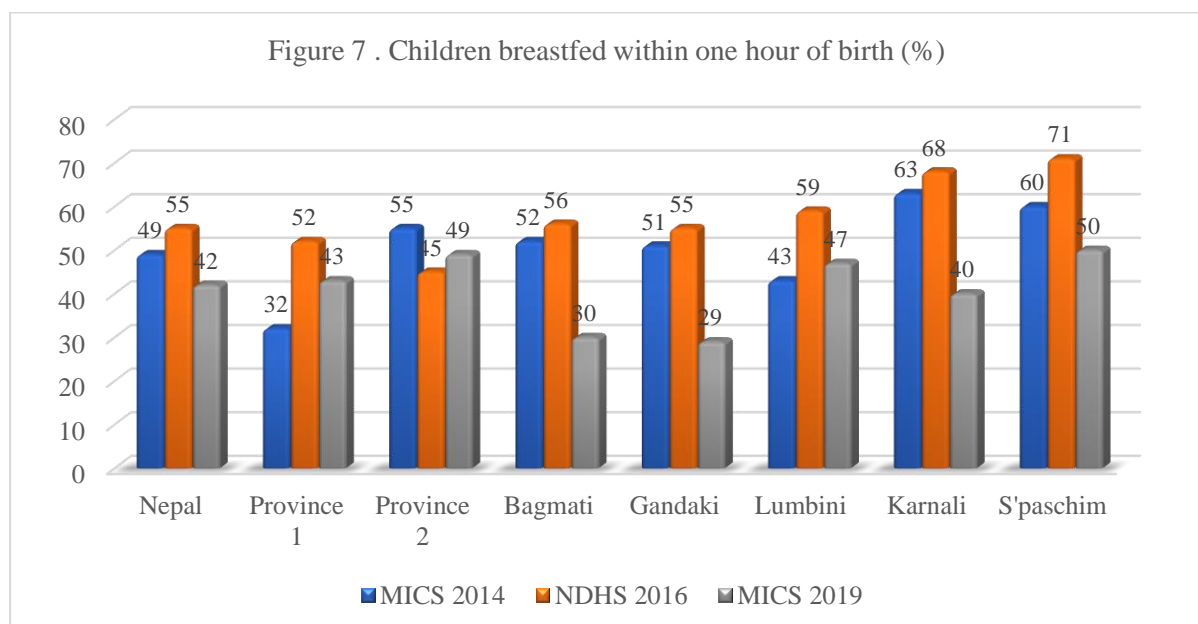
Infant Nutrition

Breastfeeding is one of the most effective ways to ensure child health and their survival and promote healthy growth and development. Breastmilk is the ideal food for infants. Early initiation of breastfeeding is important for both the mother and the child. The studies revealed that 4 in 10 children (42%) were breastfed within one hour of birth. The percentage of children who were breastfed within 1 hour decreased from 49% in 2014, increased to 55% in 2016 and again decreased to 42% in 2019.

Similar decreased trend has been found in the provinces compared with the figures for NDHS 2016 and MICS 2019 (Figure 7). Exclusive breastfeeding among children under 6 months increased from 57% in 2014 to 62% in 2019. Overall, 23% of children 0-23 months are bottle fed in 2019 which was only 12% in 2014. The percentage of children who were introduced to complementary foods at 6-8 months slightly increased from 86% in 2014 to 87% in 2019. In 2014, 32 % of children aged 6-23 months were fed a minimum acceptable diet, and in 2019, this percentage decreased to 30%. Similarly, percentage of children who received food the minimum number of times appropriate for their age decreased from 74% to 69% during the same period. However, the percentage of children fed minimum number of food groups has improved from 37% to 40% in the last 5 years (UNICEF, 2019).

The most consumed foods are made from grains (71% among breastfeeding children and 97% among non-breastfeeding children), followed by food made from legumes and nuts (54% among breastfeeding children and 78% among non-breast-feeding children), and food made from roots and tubers (44% among breastfeeding children and 62% among non-breast-feeding children). The percentage of children fed according to the minimum recommended standards has improved in the last 5 years. In 2011, 24 % of children aged 6-23 months were fed a minimum acceptable diet, and in 2016, this percentage increased to 36% (MOH et al.; 2017).

The family size and age of household head were negatively correlated with Dietary Diversity (DD). DD was lower among the Madhesi, and unprivileged ethnic groups compared to the Chhetri group, and among farm households compared to non-farm households. TV and telephone ownership are positively associated with DD. Increases in remittance and cash transfer are positively associated with DD, and DD is lower among poor households than among non-poor households. This evidence shows that income is a clear determinant of DD. Parent illiteracy also is negatively correlated with lower DD, though DD is higher in households containing an illiterate father than in those containing an illiterate mother (Kumar et al., 2020).



Access to affordable healthy and nutritious diets

Comparing the household food consumption (gm per day per Adult Male Equivalent-AME) with Food based dietary guidelines (FBDG) for different food groups, it shows that the consumption of starchy staples, fats/oils and dairy product was higher than the FBDG. On the other hand, the consumption of vegetables was less than 44 percent, fruits less than 35 percent and proteins less than 15 percent than that of FBDG (Table 3).

Table 3. FBDG and actual consumption of foods at household (gm/day/AME)

Food Groups	FBDG	Consumption	% Change
Starchy staples	435	488	12.2
Vegetables	350	197	-43.7
Fruits	150	98	-34.7
Protein Foods	120	102	-15.0
Dairy	250	271	8.4
Fats and oils	30	34	13.3
Total	1435	1190	-17.1

Source: World Bank (2021)

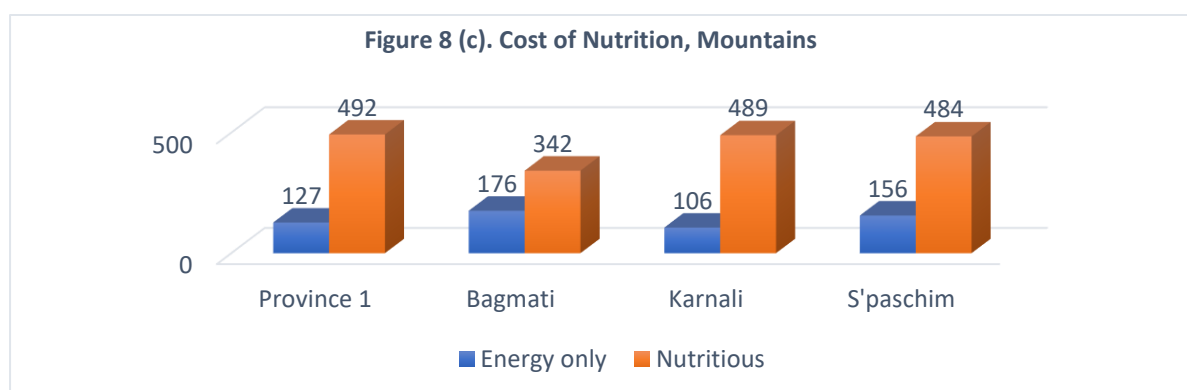
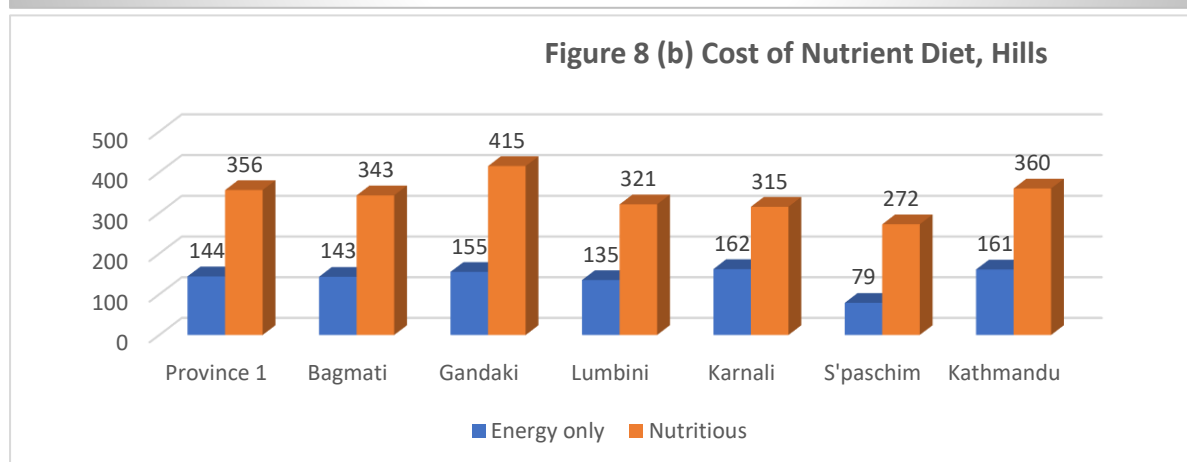
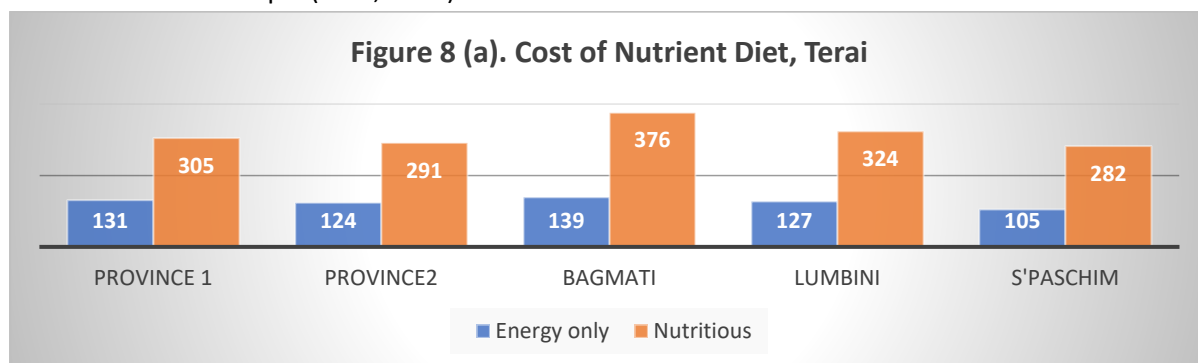
Cost of a Recommended Diet (CoRD): The share of CoRD to the total food expenses was 83 percent while it was 34 percent to the total household expenses in Nepal. The CoRD in Nepal per adult per day (in \$2011 PPP) was 1.79 while the consumption was 2.16. Comparing CoRD against the mean daily food expenses to measure the affordability of a nutritious diet shows that 55 percent households spend less on food than CoRD in Nepal. The share of the cost to meet starchy staples need to total CoRD was 23 percent while that of fats/oils was 6.4 percent. The combined share of fruits and vegetables takes a large share (about one-third of CoRD). The share of protein food cost to total CoRD was close to a fifth while that of dairy was at 17 percent. The households overspend on starchy staples, protein, and oils.

Days of food consumption patterns weekly clearly demonstrates that the consumption of milk dairy products, meat, eggs, and fruits is found to be poor. It might lead to protein deficiency if not properly managed the diet. A single food may not fulfil all the macro and micronutrients. So, multiple foods should be included to fight against diseases, and promote growth & development, and maintenance as well. The data shows the satisfactory consumption of cereals, root & tubers, fat, and sugar. However, high biological availability of food amounts like meat, fish, and egg show 2.3 days, and milk & dairy products as 4 days which represent low consumption of calories (Maharjan & Chaudhary, 2021).

Cost of Nutrition

In general, almost all households could afford to meet energy needs, but a nutritious diet would be unaffordable for at least 1 in 5 households. The cost for energy only and nutritious diet for 5 members family shows a wide variation among provinces and ecological regions (Figure 8). The cost of nutritious diet is the highest for the mountains followed by the hills and terai. Comparing the provinces in Terai, the lowest cost for nutritious diet is Rs 282/day for Sudurpaschim followed by Province 2, Province 1, and Lumbini. The highest cost is for Bagmati province. In case of the mountains, the highest for nutritious food is in case of Gandaki followed by Kathmandu (metro city), province 1, and Bagmati province. The lowest cost was for Sudurpaschim province. In case of mountains, province 1 cost family should spent the highest cost followed by Karnali province, Sudurpaschim and Bagmati province (WFP,

2021). The interventions such as school-feeding programmes and homestead production programmes also helped to improve diet quality and reduce non-affordability of nutritious diets at the household level in Nepal (WFP, 2021).



A study done by Thapa & Shivley (2017) showed that a rise in milk and sugar prices potentially had deleterious impacts on short-term child nutrition outcomes. The factors positively associated with height for age indicator of child nutrition were mothers' education, husband living with wife at home, drinking treated and safe water and household rearing livestock while the factors such as unemployed mothers, mothers working in farm, total number of children in the family, mothers smoking cigarettes, currently breast feeding, baby delivering at home, poor households, food deficit district and altitude were negatively related. For weight for height indicator (child nutrition), the factors that were positively associated with the short-term nutrition outcomes are wealth index, road density and altitude.

Food Safety

Food safety is everyone's responsibility and therefore everyone's business. It is also important to note that keeping food safe is a complex process that starts on the farm and ends with the consumer. In a period characterized by acute observations of food chains and the risks of foodborne disease, the consumption and production of safe food have immediate and long-term benefits for people, planet, and the economy.

Food safety and quality is an emerging domestic issue. Food safety is a concern in terms of consumer health, farmer safety (as users of hazardous inputs), and the potential for agricultural commercialization. Toxic residues in vegetable samples from Nepal exceeded the thresholds permitted by the European Union by a factor of 4 for eggplants, 17 for tomatoes, and 49 for chilis (ADB, 2019).

Anthropogenic hazards are also reported for major food categories at different value chains. Major anthropogenic threats are residues of pesticides, hormones, and higher doses of antibiotics in food and in the environment in general. The summary of anthropogenic hazards in different sub-groups (FAO, 2014) is presented as follows.

Crops: Overdose of pesticides in commercially produced vegetables; application of pre-set spray schedule in tomatoes and other off-season vegetables irrespective of the incidence of disease or pests; handling and application of pesticides without proper protective gear; non-compliance to waiting period; use of pesticides in fruits and vegetables even after harvest to increase shelf-life; use of unsafe ripening agents; sales of some banned pesticides under other names, application of hormones in vegetables, use of unsafe colouring matters in fruits and vegetables make appearance attractive, use of fresh faeces and urine, and use of contaminated water for irrigation.

Livestock and poultry: Over dose and higher frequency application of antibiotics in poultry, sale of poultry even on the same day after administering antibiotics, use of chloramphenicol in poultry, use of oxytocin hormone in lactating animals, use of sodium bicarbonate, sugar, water in milk as preservative, inadequate cleaning of udder before milking, use of plastic and aluminium cans for milk transport, unhygienic slaughtering, transportation, cutting, packaging, storage, distribution of meat, I contaminated washing water, untidy holding containers and exposure of meat to flies and birds.

Fisheries: Habitat destruction through water pollution and poisoning, inappropriate aquaculture practices, residues of agrochemicals and veterinary drugs, heavy-metal contamination, unauthorized supply of seeds of some of the fish species, improper use of production inputs.

Food: Food quality deterioration, toxin development, contaminants, unsafe food additives as preservatives and colour, use of untreated water, lack of hygienic processing and handling, irradiations for food sterilization, Metanil yellow and rhodamine in sweets, Sudan red in chilli powder.

In view of the growing concern on food safety, the Government of Nepal is attempting to (i) establish national safety standards and a system to test and assess against Indian standards; (ii) introduce a surveillance system (including sanitary and phytosanitary standards, systemic inspection, and sampling); and (iii) regulate the distribution and use of hazardous inputs (through border control;

registration and licensing of distributors; proper labelling; and education of farmers, distributors, and local regulators). Although these efforts are underway, the effective enforcement of food related legal and regulatory aspects is quite weak as the entrusted public agency lacks adequate institutional and human resources capacity.

The use of food chart for healthy diet is very crucial. There are limitations in sharing proper information to consumers in a convincing manner which is against the right to information. Likewise, the purchasing capacity of consumer as well as weak distribution system are also impacting on proper utilization of food as per the nutritional requirements. According to the Department of Food Technology and Quality Control (DFTQC), the cereals, roots, and tubers to eat adequately, pulses and legumes to eat at every meals, fruits and vegetables to eat daily, livestock products regularly and fats, oils, sweets to eat cautiously (DFTQC, 2017). In addition, UNICEF advocates for child right to nutrition (UNICEF, 2020).

Impact of Covid-19

At present, the nutritional status varies by province. At the provincial level, the Karnali Province has the lowest level of food security (food-secure households are only 22.5%) and the severely food-insecure households are about 17.5%. (MOH et al., 2017). NDHS shows that nutritional status among women is found in the ratio of normal by 61%, thin by 17%, overweight by 17%, and obese by 5%. Similarly, men were found normal (66%), thin (17%), overweight (15%), and obese (2%). The overweight and obese are found more in women than men. These are related to food and its utilization. Similarly, the under nutritional problem in a child is chronic than in adults. The data shows the different form of malnutrition in under 5 years children as wasted 12%, underweight 24 %, and stunted 32%, overweight 2.6%. (UNICEF, 2019).

Nepal imposed a lockdown to control the spread of the corona virus since 24 March 2020 and partially opened from the first week of September 2020. A vaccination drive began on 27 January 2021. It is not sure to meet the vaccination target due to the unavailability of vaccine and its management. The infection rate began increasing from late March 2021, the authorities announced lock down and strict measures are being adopted on the movement and operation of economic activities.

A rapid assessment of socio-economic impact of COVID-19 in Nepal revealed that the virus will seriously derail the achievement of SDGs if external donor supports are not made available on scale needed to fight the disease and its impact (UNDP, 2020). Sudurpaschim province, Province 2, and Karnali province where food insecurity status and poor food consumption, and poor dietary diversity are more common, will be most affected. Similarly, food security should be more concerned among daily wage laborers and cash crop producers and less diversified livelihood groups in Nepal (Maharjan & Chaudhary, 2021).

A recent assessment revealed that 16.8 percent of households had inadequate food consumption and 2.5 percent had poor dietary diversity in December 2020. Furthermore, 7.4 percent of households adopted negative livelihood coping strategy to address food shortages and about 2.7 percent of households reported that the food they had in stock was insufficient to meet their needs. About 42.7 percent of the children between 6-23 months of age did not meet the minimum recommended dietary diversity. Karnali and Sudurpaschim provinces, the most food insecure provinces of the country, have

the highest proportion of food insecure households, with 24.1 and 21.2 percent of households consuming inadequate diet, respectively. Inadequate food consumption was also relatively high in Province 2 (16.8%). A reduction in income was reported at national level (21%) in the last 3 months which has impact on the market purchase of the food and spending for family welfare. A severe loss in income was reported by 5.3 percent of households, nearly 12 percent of households reported a moderate reduction, and a small proportion of households (3.9%) noted a slight reduction. Inadequate food consumption and food insufficiency were more common among households that reported job loss and income reduction, compared to households that did not experience job loss and income reduction (MOALD & WFP, 2021).

COVID-19 pandemic has affected the economic growth rate in two-decade period as it has gone to negative (2.12%) in FY 2019/20 whereas the growth of agricultural sector is 2.6 percent. Similarly, the supply of production inputs such as fertilizer, seeds and breeds, pesticides and agricultural implements is affected; value chains of food grains, fresh vegetables, and fruits affected which resulted in increase in the prices. Furthermore, the supply of feeds, veterinary drugs, and vaccines required for the livestock, poultry and fisheries has also been affected (MOF, 2021).

The impact of COVID-19 has impacted agricultural sector the most in terms of loss in agricultural produces, interruption of services and disruption of value chain. In the first year of COVID-19, the study of 61 districts and 162 agricultural entrepreneurs, it is recorded that, there was a loss of 30% in fresh vegetables, 24% in poultry and 13% in dairy (MoALD et al., 2020).

Underlying Drivers of Food Insecurity and Poor Nutrition

The **key drivers** of food and nutrition insecurity, unaffordability of healthy and nutritious foods and poor food safety are described below

- Low level of agricultural technology adoption and low level of productivity due to biotic and abiotic factors and poor water management.
- High prevalence of pre-harvest and post-harvest losses.
- Inadequate infrastructure such as physical infrastructures- irrigation to increase production and productivity, roads for connectivity and storage facilities to add temporal value.
- Migration and unsystematic settlement in productive land due to lack of proper land use plan and non-implementation of land use policy in the local level.
- Loss/ Erosion of local biodiversity and existence of poor food diversity.
- Low education and awareness level on the nutritive value of underutilized crops/commodities.
- Policies that favour energy-dense foods of minimal nutritional value over nutritious foods.
- High cost of nutritious foods relative to people's incomes, seasonality related to climate and remittances affect food prices affordability of nutrient adequate diets.
- Inadequate maternity protection and workplace support for women to comply with breastfeeding recommendations.
- Poor nutrition including poor breastfeeding and complementary feeding practices.
- High food prices, rising demand for food due to population growth, urbanization etc.
- Poor implementation and enforcement of the regulation of marketing of Breast Milk Substitute (BMS).

- Poor coverage of the Mother-Baby Friendly Hospital Initiative (MBFHI) and MBFHI Facility program in Nepal.
- Poor community support for vulnerable communities where existing health system is weak.
- Poor complementary feeding counselling- shortage of health workers trained to counsel and support mothers with both breastfeeding and complementary feeding.
- Poor level of education of the caregivers, beliefs and cultural taboos, the workload of the caregiver, poor access to resources and poverty.
- Preference for readymade ultra-processed/junk foods.

Key Propositions, Pathway, and Game Changing Solutions/Actions

Proposition: Increased agriculture productivity and develop sustainable food chain for affordable safe, healthy, and nutritious diet to improve levels of nutrition, ensure all people to be well nourished and healthy and achieve zero hunger.

Pathway: Ensure policy coherence (especially of the agriculture, food security and nutrition, education and health) and food governance and encourage farmers/youth to involve in agricultural sector to intensify the production of affordable, safe, healthy and nutritious food for all people in a sustainable way.

Game Changing Solutions/Actions:

- Coordinate and facilitate the Rights to Food and Food Sovereignty Act, 2018 by developing regulations and making policy coherence for an accountable food governance in place to address hunger and malnutrition and access to food as provisioned by the constitution of Nepal.
- Ensure institutionalizing Food Security/Right to Food and Food Sovereignty Monitoring System at all levels to strengthen evidence-based planning for the implementation of Food System Transformation initiatives.
- Allocate adequate funds for research and innovation to generate sustainable agricultural technologies that are suitable for diverse agro-ecosystems and ensure that these technologies are available to small producers at affordable cost.
- Create additional employment opportunities to youth, women and poor and disadvantaged groups for encouraging the production and consumption of healthy food and increased income through supporting in skill enhancement, finance and technologies and markets.
- Build resilient seed system (local crops/land races; maintain genetic resources, breeding) through the seed bank establishment/participatory breeding/seed selection as diverse genetic resources are declining every year.;
- Use sustainable production techniques to conserve the pollinators and predators for their beneficial effect on increasing the productivity of many crops and commodities.
- The provincial and local governments should prepare the inventory of the fallow land in their respective domain and formulate working strategy to lease out such lands to landless people for suitable crops and commodities and livestock production.
- Provision of cash support for bringing fallow lands into cultivation. As a matter of fact, mechanization and cash support policy would help in bringing abandoned farmland into cultivation. If the currently abandoned land is brought under cultivation and the rest of the

farmland is intensively cultivated, Nepal's desire to become self-sufficient in food could be achieved.

- Although high quality food may be available, but some households and communities do not have minimum financial resources needed to access it. For this, scale-up social protection programs by expanding their reach, enhancing financing and delivery capabilities, and making systems more adaptive to crises.
- Lack of effective cold chains at different value chain results loss in perishable commodities. Develop a multi-stakeholder effort for a highly integrated, sustainable cold chains.
- The high cost of perishable, nutritious food items such as vegetables, fish, and dairy has reduced the access and overall consumption as this high cost is partly driven by poor infrastructures. Develop a public-private partnership to provide the investment and operational capacity needed to improve infrastructure and thus reduce costs and risks faced by small-scale nutritious food producers and value chain entrepreneurs.
- The present strength of the regulatory agency (DFTQC) is not adequate to monitor the quality of all food manufacturers and those small enterprises operating without notice to the departments. Strengthen the capacity in terms of competent manpower and institutions at different levels. Similarly, introduce the system certification and third-party certification which can help to control the quality of the processed food products.
- To address the issues caused by the COVID-19 pandemic, it is important to identify, collect, conserve and research the indigenous species of crops, animals and other useful plants and promote the resilience aspects of subsistence farming. This is crucial in the hills and mountains to achieve resiliency at the time of future shocks due to climate or pandemics while also promoting commercial or semi-commercial farming to achieve food sufficiency.
- Provision of support for mechanization that is suitable to the terrain - like larger machines (tractors and harvesters) in Terai and small machines for seeding, plowing and threshing in the hills. Because of migration of young people, there is labor shortage in farming, and such mechanization helps in coping with such shortages, and makes farming less drudgery, especially taking into women's heavy involvement in farming.
- The condition of malnutrition in Nepal is a public health crisis. It is crucial in all provinces to prevent malnutrition through effective multisectoral approach including promotion, protection and support for IYCF (breast feeding and complementary feeding), promotion and support for maternal diets, treatment of moderate and severe acute malnutrition and prevention and control of disorders from micro-nutrient deficiency adopting food-based approach, including fortification of staple foods
- Although School Meal Program is multi-sectoral in nature, it is implemented or seems like a priority of only MOEST. In order to make it further effective, the involvement of MOALD, and MOHP is required with clear roles and responsibilities and mechanism for coordination and collaboration.
- It is necessary to improve/strengthen institutions and establish appropriate governance structures for effective implementation of policies and programs that would enable Nepal to achieve SDGs 1 and 2 by maintaining all four pillars of food security even during crisis times like COVID-19 pandemic.
- The local agricultural production system is resilient to many hazards and shocks and may help to cope with and adapt to the present crisis of COVID-19. The diversification of crops and income

generating activities within the farming system in the hills and mountains is considered as adaptation to face the crisis like COVID-19 pandemic. In this regard, customize the existing farming system to make it further resilient and conserve & utilize local crops/commodities that have high nutritive value.

- Promote biodiversity based ecological agriculture, management of natural resources, community-based food stocking/food bank, implement organic/high value cash crop production campaign (*Mulyawan* Campaign) and off farm employment opportunities to reduce poverty driven food insecurity.
- Support and motivate for the adoption of skills, knowledge, and technologies to minimize food the risks. Increase qualified human resources at all levels, Capacity building of three levels of the governments
- Implement nutritional sensitization and social protection programs, and cooperative-based insurance system at different levels, and improve Food System Governance.
- Ensure land rights to cultivators/peasants, land to landless, classification of farmers/peasants based on ownership and production, and promote income generating programs, and improve access to production inputs and markets.
- Enhance and strengthen collaboration and partnership among the tiers of Government and stakeholders to increase productivity and enhance the access to safe and nutritious foods.
- Implement social protection programs and link them with nutrition sensitive production systems and programs, ensuring food distributed through such programmes are nutritious including essential micronutrients.
- Enforcement of food safety regulations for food production and supply employing GAPs, IPMs, IPNMS, keeping infant and children's right to receive safe, affordable, and nutritious food. Enact and enforce the regulation on the marketing of the Breast milk Substitute (BMS ACT and Regulation) for protecting, promoting and supporting breastfeeding and complementary feeding. Improve the provision of lactation management and counselling for women through maternity services.
- Introduce and or improve Family Friendly Policies – extend provisions for fully paid maternity protection up to 6 months, establish work place environments and policy for female workers, in formal and informal settings (support for women to breastfeed, provision of child-care, provision of incentives).

Assessing the Success of Actions:

The implementation of above game changing solutions/actions should be outcome oriented that ensures safe and nutritious food at affordable cost. The important options for assessing the actions being successful should include the followings.

- Effective implementation of food safety policy, Food Act and regulation and compulsory labelling of the nutritive value of food.
- Development and adoption of effective surveillance system for food safety and nutrition to be implemented by the local government.
- Harmonization of the food trade and distribution system and tracking and tracing system.
- Survey and monitoring of the access and consumption of safe, diversified, and nutritive foods.
- Appropriate management of agricultural land.

- Food buffer stock in each municipality maintained and effective implementation of Minimum Support Price.
- Riverbed/riverbank farming promoted with the involvement of poor and disadvantaged people.
- Effective implementation of quarantine for plants, animals, and food.
- Strong M&E system with appropriate indicators developed and implemented.
- Joint mechanism in food and nutrition activated for effective implementation of feedbacks and suggestions.
- Mechanism among the three tiers of government developed to coordinate and collaborate the food and nutrition at all levels
- Develop result indicator and framework for each program and carryout periodic review.
- Increased access of small farmers to resources and inputs and enhanced access to markets for agricultural products.
- Ensuring access to technologies for agricultural production, development of supportive/incentive package and expansion of insurance to the farmers.
- Categorization of farmers into small, medium, and large group, develop appropriate packages to suit the type of farmers and commodity/crops.
- Developed/strengthened mechanism for progress reporting and auditing and increased use of ICT.
- Delineate clear roles and responsibility and develop accountability mechanism

Collaboration/Partnership and Roles/responsibilities of Governments and Food System Actors:

Coordination and collaboration among diverse food system actors such as private sectors and 3 tiers of government are essential to ensure proper planning and implementation of actions for ensuring safe and nutritious foods for all. The specific suggested roles and responsibilities of the federal and provincial and local governments and other food system actors are outlined below.

- Prioritize the programs for increasing the production and productivity of nutritious foods at local level and integrate food safety policy with agriculture and nutrition policy.
- Strengthening national research capacity on the pandemic that may be caused due to the consumption of poor-quality food and nutrition.
- Prioritize effective Food safety and nutrition surveillance (in all the level) for development of preventive measures and adoption of technology in food chain based on food-based risk & Nutrition assessment.
- Prioritize Food innovation and food formulation for tackling hidden hunger, undernutrition and overnutrition based on locally available foods.
- Preparation of emergency policy and action plan for food safety and nutrition management.
- Awareness raising programs on food safety and nutrition.
- Mobilize and collaborate with diverse food system actors by the federal, provincial, and local governments and private sector in enhancing access to safe and nutritious foods for all.
- Transformation for sustainable consumption of foods through the collaboration of three tiers of governments.

Federal government:

- Enactment of Acts and Regulations, Management of Foreign aid for projects, Implementation of research-and extension-based activities and promotion/mobilization of Nepal Agriculture Research Council.
- Research and technology development, implementation of large-sized projects, provide or ensure justice to landless farmers in terms of their rights to food.
- Acting as a role of facilitator for effective coordination among three tiers of governments.
- Capacity development of the human resources and their appropriate management, publication, and maintenance of national level statistics.
- Women empowerment at the local level for increasing food diversity and childcare (by the local govt).
- Multi-sectoral strategy (involving federal, province and local governments) for nutrition and food security improvement.
- Formulate and implement the National Food Plan encompassing both food security and nutrition based on the Right to Food Act.
- Carryout demand-based research and studies.

Provincial Government:

- Establishment of Resource/development centers, entrepreneurship development, research on crops and commodities, establishment of province as a centre of statistics.
- Capacity building of the human resources and promoting coordination and collaboration with federal government and local levels.
- Monitoring and Evaluation of the programs, database management at provincial level
- Self-sufficiency program on seeds, feeds, fertilizers, and program implementation on ensuring markets for products
- Operationalization/implementation of medium-sized projects, carryout research for farmers' demanded techniques/technologies.
- Implementation of nutrition related programs to landless farmers, development of policies and programs considering geographical diversity and ecological context
- Collaborate with food industry to ensure the quality of food as a social responsibility

Local Government:

- Technical assistance and support, balanced allocation and management of resources, implementation of PPP approach in agricultural development.
- Develop a mechanism for distribution of supports and subsidies and technical skills and technologies in a balanced manner.
- Development of resource centers, entrepreneurship development among the farmers, monitoring of quality and standards.
- Community empowerment, behaviour change, communication, and socio-economic empowerment.
- Promote awareness of low-cost food, promote low cost high nutritious foods, and prepare food menu with the locally available food.
- Capacity building of the human resources and database management at Municipal level.
- Promotion of commercialization by identifying production pockets.

- Market promotion for the products.
- Mobilization of local farmers for sustainable production of foods and creation of linkages with school meals programme for consumption of locally produced nutritious food and promotion of nutrition education.
- Collection and management of statistics and information by the local government and request for needed support from the province.

Other stakeholders:

- Supply of quality production inputs, market promotion for the products.
- Provide technical and financial support.
- Research and Demonstration of technologies.
- Awareness raising on nutrition, food safety, consumption.
- Feasibility studies on production, marketing, nutritional products etc.

Action Track 2: Shift to sustainable consumption patterns

This Action Track aims to generate new and support existing game-changing solutions that can catalyse shifts in consumption through changes in food policy, food environments, private sector actions and offerings and consumer behaviour. The consumer behaviour is a key concept that can be analysed from a variety of perspectives and methodologies. Consumption needs to be looked at as a process of decisions and actions, not limited to the moment of purchase, but considering the whole lifecycle of a product or service.

Food environment

Promoting sustainable consumption is a crucial aspect of sustainable development, which depends on achieving long-term economic growth that could ensure environmental and social needs for both present and future generations. Sustainable consumption is intended to address the increasing health and environmental concerns. Unhealthy diets are considered the principal source of poor health and environmental degradation in many countries including Nepal.

Food environments encompass the physical, economic, political, and socio-cultural contexts in which consumers engage with the food system to make their decisions about acquiring, preparing, and consuming food. Food environments are a combination of the ‘spaces’ in which people make decisions about food, and the foods and drinks that are made available, accessible, affordable and desirable in those spaces (EPHA, 2019). It is to note that to create an environment conveys a meaning of ensuring foods, beverages and meals that contribute to sustainable healthy diets are the most available, affordable, convenient, and widely promoted. Such environments make the healthy and sustainable food choice the default choice, while limiting the promotional opportunities for foods associated with unhealthy and unsustainable diets. Furthermore, such food environments will enable and empower the adoption of healthy, tasty, sustainable eating patterns.

The factors that affect food choices can be diverse. The key determinants of general food choice can be categorized as food-internal factor (sensory and perceptual features), food-external factors (information, social environment, physical environment), personal-state factors (biological features and physiological needs, psychological components, habits and experiences), cognitive factors

(knowledge and skills, attitude, liking and preference, anticipated consequences, and personal identity), as well as sociocultural factors (culture, economic variables, political elements) (Chen & Antonelli, 2020). The consumers' socio-demographic factors such as income and education, taste, physical appearance of the product, prices etc. may influence the choices. In Nepal, the local food products are more preferred to foreign and unbranded products. However, there are consumers who evaluate the foreign products as superior to domestic ones. With the increase in income, it is likely that the food baskets change from cereals based to vegetables, fruits, and animal products. But there has not been an increasing trend of per capita income in Nepal (Sharma & Pudasaini, 2020). It is evident that there are disparities between rich and poor in terms of consumption of healthy diets and health status.

Context in Nepal

Sugary and highly processed diets

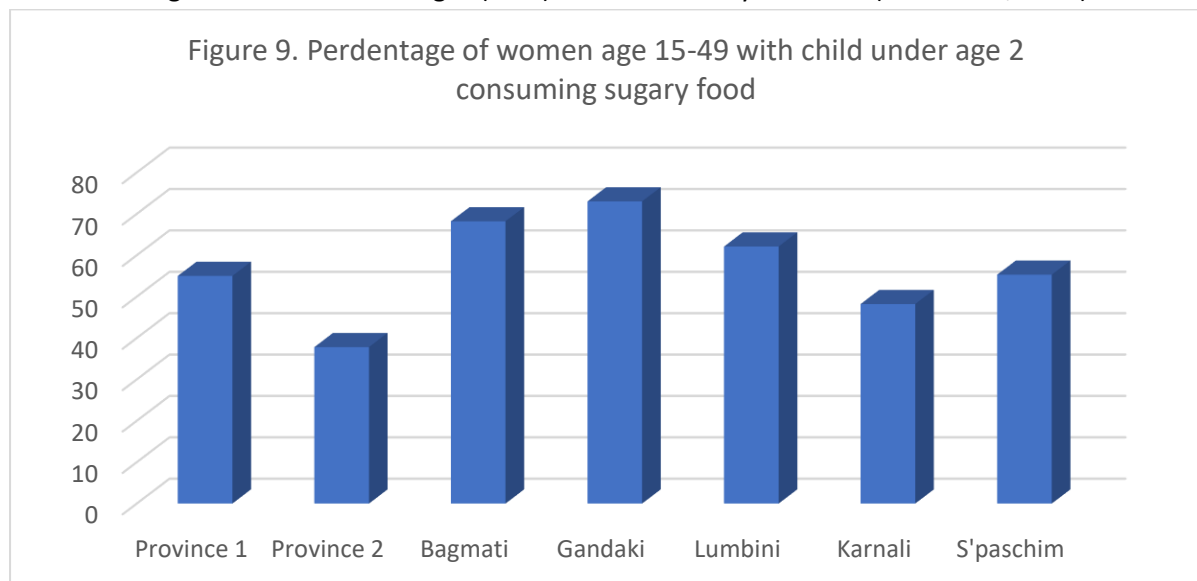
Nepal has a changing dietary pattern towards fat and sugar and decreasing intake of carbohydrate with increasing fast-food intake. Furthermore, the country is with increasing non-communicable diseases (NCDs) and decreasing communicable diseases with high prevalence of under nutrition. The relative availability of staple foods has decreased in Nepal. They have been essentially replaced by energy from plant fat. An increase in the proportion of fat in the adult diet and under nutrition in childhood has coincided with increased overweight/obesity and other NCDs in later life.

In Nepal, children under 2 may be getting on average a quarter of their energy intake from items such as biscuits, instant noodles, and juice drinks, which is lowering their intake of essential vitamins and minerals. Many businesses at present focus on producing ultra-processed food items because they can be produced at lower cost, have long shelf-life and high retail value which makes them highly profitable. Because of this, these foods are easily available even in the remote areas of Nepal, where a choice of vegetables, fruits and fish is not (UNICEF, 2019). The demand for highly processed foods will continue to increase because of convenience, cost, and taste. In the early stage of life (less than five years), children may also have preference for sugary foods, processed foods etc. This impacts in children's eating habits and behaviours that leads to the worsening overall health conditions, wellbeing and moving to the overweight/obesity with lifelong consequences.

Consumption of unhealthy snack foods and beverages (USFBs) in low- countries like Nepal is rising. The share of USFBs to consumers in highest consuming groups was 46.9% of total energy intake (TEI) while it was 5.2% of TEI among the lowest consuming group. Compared with low-USFB consumers, high-USFB consumers had lower nutrient intakes and a greater proportion were at risk of inadequate intakes for 8 nutrients (Pries et al., 2019).

Over two-thirds of adolescent girls in both rural and urban areas reported consuming sugary foods (MOH et al., 2018). For a school-aged child, it was revealed that the consumption of junk foods such as salty crisps, sweet biscuits, and sugary soda increases the cost of the nutritious diet by 40%, 48%, and 124% respectively, as these foods fulfil energy requirements of a child but do not add to micronutrient intake (WFP, 2021).

The consumption of sugary food varies by ecological regions and provinces, educational attainment and income groups among the mothers aged 15-49 with a child under age 2. In general, more than 50% of the women have consumed sugary food which is the highest for 20-29 age group (56.6%). This proportion is higher for urban residents (57.9%) than rural residents (51.8%). By ecological regions, this level is the highest for the hills (68.1%) followed by mountains (50.4%) and Terai (46.5%). The consumption level of sugary food increases with the increase in education status of women. The highest percentage of mothers with education level of SLC (74%) and above consume sugary food whereas only 40 percent of women consume sugary food with primary level of education. This level is higher for the upper wealth quintile (71.9%) whereas lowest for bottom income quintile (50.2%). This proportion varies by the provinces (Figure 9) which is the highest for Gandaki and lowest for Province 2. (MOH et al., 2017). It is also revealed that 16.2% of children in Kathmandu valley consumed sugar sweetened beverages (SSBs) within the first year of life (Pries et al., 2017).



Non-communicable Disease (NCD) and triple burden of disease

There has been changes in the death pattern based on the nature of the diseases in Nepal. In 1990, communicable, maternal, neonatal, and nutritional (CMNN) diseases were responsible for approximately two-thirds (63.6%) of total deaths. The proportion of the deaths from the CMNN diseases reduced to 26.8% in 2015. This is projected to be about one-fifth of the 1990 figure (12.47%) by 2040. Conversely, deaths from NCDs reflect an upward trend. NCDs claimed one-third of total deaths (29.91%) in 1990, while NCDs were responsible for about two-thirds (63.31%) of total deaths in 2015. In 2040, it is predicted that NCDs will contribute to over two-thirds (78.64%) of total deaths. Less than a tenth (6.49%) of the total deaths in Nepal in 1990 were associated with injuries which increased to 13.04% in 2015, which is projected to decrease to 8.89% in 2040 (Pandey et al., 2020).

In Nepal, on an average life expectancy at birth increased from 58 years in 1990 to 71 years in 2017. Three leading causes of DALYs (disability adjusted life years) in 2017 were cardiovascular diseases (CVDs), maternal and neonatal disorders and chronic respiratory diseases. High systolic blood pressure, smoking and high fasting plasma glucose were leading contributors to the NCD DALYs burden. At any ages ≥ 40 years, NCDs and injuries were responsible for 75–82% of total DALYs. Injuries, self-harm and violence, mental, neurological, and musculoskeletal disorders

superseded CVDs to become the leading causes of DALYs in young population aged 15–35 years (Mishra et al., 2019).

In Nepal, there has been a rise in overweight, obesity and diet-related noncommunicable diseases. Since 2000, obesity has increased by 2 to 3% in men and women. Noncommunicable diseases now account for around 40% of the country's total disease burden and around 12% of adults in Nepal have diabetes, with unhealthy diets recognized as a leading risk factor. This is resulting in a concurrent 'triple burden' of malnutrition, where energy or micronutrient deficiencies in parts of the population co-exist with overweight, obesity and the associated diet-related non-communicable diseases in others.

This 'triple burden' of malnutrition does not just affect our health. It also has a significant economic impact. In Nepal, an estimated 2-3% of GDP (US\$250-375 million) is lost every year on account of vitamin and mineral deficiencies alone. When other impacts of child undernutrition are included, for example, years of lost education, impaired cognitive performance and lost productivity, GDP losses could be as great as 11% per year. Adding up with the growing costs related to the treatment of diet-related noncommunicable diseases, there could be a considerable economic consequence for Nepal (GLOPAN, 2020).

According to the Steps Survey, Nepal is facing triple burden of diseases, namely communicable diseases, re-emerging diseases, and non-communicable diseases (NCD). Rising trend of NCD prevalence has led to the estimated death of 60% of total deaths (Dhimal et al., 2010).

Health impacts of poor-quality diets

The health impacts associated with poor quality diets are significant. Unhealthy diets are a leading cause of non-communicable diseases (NCDs), mainly cardiovascular diseases, cancers, and diabetes, that result in death. Both overweight and obesity are significant risk factors for NCDs and increasing healthcare costs linked to rising obesity rates are a trend across the world.

One of the biggest challenges in Nepal is the cost and affordability of healthy diets. The healthy diets are unaffordable for many people in every region of the world, especially for the poor and those facing economic challenges. Evidence also demonstrates that the higher cost and unaffordability of healthy diets is associated with increased food insecurity and different forms of malnutrition, including stunting and adult obesity. Shocks, like the COVID-19 pandemic, exacerbate this because they negatively affect poor people's quality of diet and make healthy diets less accessible in many parts of the world (World Bank, 2021).

The micronutrient deficiency (MNDs) is also prevalent in Nepal with varying level of effect. The underlying causes of MNDs are insufficient access to food, inadequate health care, and poor caring practices that inhibit growth and health. In Nepal, more than a quarter of the population consumes inadequate food and the average household food can meet their food needs for only about four months (MOAD, 2013). Similarly, the ineffective health care system and poor caring practices still prevail in most of the rural parts of Nepal.

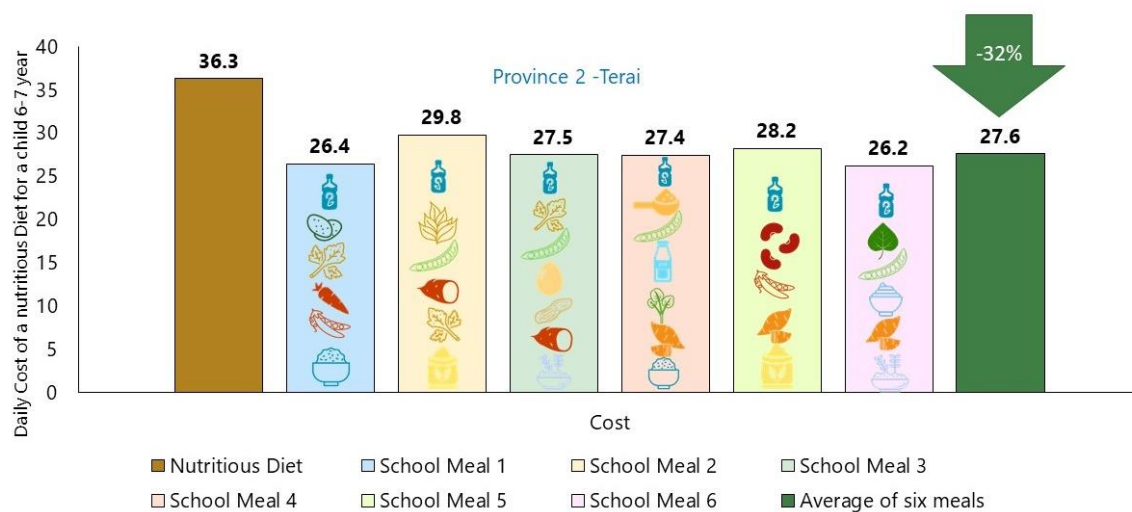
In Nepal, anaemia continues to be a widespread problem. The prevalence of anaemia is increasing in Nepal from 46% in 2011, to 53% in 2016 among children 6–59 months, and from 35% to 41% among women of reproductive age. Iodine deficiency is becoming less of an issue because of the effective salt iodization policy (95% of children below 5 years of age live in households with iodized salt, other micronutrient deficiencies are still highly prevalent. Although a majority of children 6–59 months were reached through the vitamin A supplementation program (86%) in the 6 months preceding the survey, the consumption of vitamin A-rich foods among children 6–23 months stands at 63 percent. This suggests that vitamin A deficiency may still be an issue, particularly among children 6–59 months (MOH et al., 2017).

A study also revealed that Zinc deficiency was seen among 87.3% children (under five years) and 61% pregnant women (15–49 years of age). Similarly, Vitamin A deficiency is seen at 8.5% in children and 7% in pregnant women; Vitamin D in 17.2% children and 14% in pregnant women, and Vitamin B6 43.1% and 40% in children and pregnant women respectively (Bhandari & Banjara 2015).

Zinc deficiency is seen because of poor pregnancy outcome, impaired growth (stunting), genetic disorders, decreased resistance to infectious diseases. Two in ten (21 %) under 5 children (6-59 months) were zinc deficient. Provinces wise more concentration of Zinc deficiency ranged from 13 - 30% was in Karnali and Sudurpaschim Province. Ecologically, zinc deficiency among children of Mountain, Hill and Terai was 28 %, 23% and 8 % respectively. Higher proportion of children (22 %) in the rural areas suffered from zinc deficiency compared to children in urban areas (12 %). Almost three in ten children in the lowest wealth quintile had zinc deficiency (Bhandari & Banjara, 2015).

The impact of school meals in terms of reducing the cost of a nutritious diet is higher when nutrient-dense foods such as green leafy vegetables and eggs are added to the meal. Providing six nutritious school meals based on local nutritious recipes to the school aged child and to an adolescent girl would reduce the cost of the nutritious diet by 32% and 13%, respectively, thereby lowering the economic barriers households face in providing nutritious diets to children (WFP, 2021). This is presented in figure 10 below.

Figure 10: Reduction in the cost of the nutritious diet for a child 6-7 years old school children



Food loss and waste (FLW)

A sizeable amount of food is being lost or wasted. With the increasing concern and awareness about the loss and waste of food, it resulted in the adoption of a specific target for FLW reduction (SDG 12.3) as part of the Sustainable Development Goals (SDGs). This recognition was based in good part on the premise that reducing FLW would contribute substantially towards ending hunger and making consumption and production systems more sustainable (Cataneo et al., 2021).

UNEP has estimated the level of the food waste. In case of Nepal, the average household level waste of food surpassed the level at global, South Asia and our neighbors and estimated at 79 kg per caput per year. In this manner, the household food waste is estimated at about 2.25 million tonnes per annum. There are no studies on the waste at other supply chains (UNEP,2021).

Food waste reduction offers multi-faceted wins for people and planet, improving food security, addressing climate change, saving financial resources, and reducing pressures on land, water, biodiversity and waste management systems. Yet this potential has until now been miserably under-exploited. This potential may have been overlooked because the true scale of food waste and its impacts have not been well understood. SDG 12.3 captures a commitment to halve food waste at the retail and consumer level and to reduce food loss across supply chains.

The drivers of FLW differ widely along the food supply chain and may be directly or indirectly linked to a specific loss point. Causes are context specific. For example, we know that important causes of on-farm losses include inadequate harvesting time, climatic conditions, practices applied at harvest and handling, challenges in marketing produce, and lack of economic incentives to prevent losses (Delgado et al., 2021). Inadequate storage conditions and decisions made at earlier stages of the supply chain can predispose products to a shorter shelf life, causing significant losses (FAO, 2011; Liu, 2014). Adequate cold or dry storage tend to be crucial to prevent quantitative and qualitative food losses. During transportation, good physical infrastructure and efficient trade logistics are vital to prevent food losses. Moreover, well-integrated rural–urban value chains have lower losses (Delgado et al., 2017).

In Nepal, a total loss of 10% was found in tomato from harvesting to marketing. In the field, during harvesting and packaging, there was a 2% loss; negligible loss during grading and washing; 4% loss during the transportation; and 2% loss occurred during the storage. At the producer level, the insufficient knowledge about the storage, packaging, transportation, and random harvesting led to a maximum loss of tomato (Tiwari et al., 2020). Losses of horticultural products at different stages show that the total loss from loading, unloading, transportation to storage and at wholesale and retail market was 20-35% for fruits, 15-30% for vegetables, and 15-20% for potatoes (Bhattarai, 2018). Processing and packaging can play a role in preserving foods, but losses in these stages of the supply chain may be caused by inadequate facilities, technical malfunctioning of equipment, and human error.

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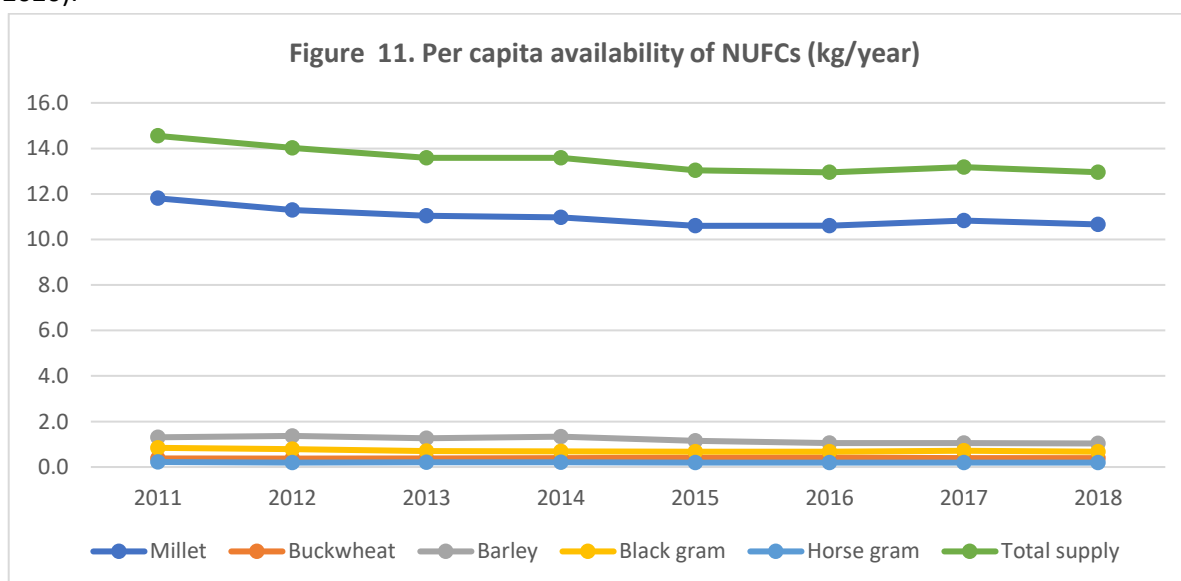
insufficient knowledge about the storage, packaging, transportation, and random harvesting led to a maximum loss of tomato (Tiwari et al., 2020).

Local food chains

Globally thousands of plant species are identified, but only 120 are cultivated for human food, and only nine supplies over 75% of the global plant-derived energy. Three crops, namely, wheat, rice and maize, account for more than half of dietary energy supply (FAO, 2009). This implies that more than one hundred edible plant species are neglected or underutilized for their nutritional value. In the mountains of HKH region, the cultivation of traditional food crops such as barley, millets, sorghum, buckwheat, beans, gram and other pulses, taro, yam, amala and jamun is suitable given diverse agro-climatic condition. Furthermore, a vast range of wild vegetables and fruit and medicinal plants is suitable for the cultivation which are important sources of micronutrients. However, agricultural intensification, which is increasingly relying on a narrow range of crops, has resulted in a decline in the cultivation of traditional food crops and the underutilization of this nutritionally valuable food source. This has led to low dietary diversity and, ultimately, a higher prevalence of malnutrition in the mountains. In Nepal, in the past, household food baskets consisted of many different edible plant species. However, due to changes in local food systems, food habits, policy priorities and several other factors, today, traditional crops are largely neglected and underutilized (Adhilary et al., 2017).

The production of major NUFCs in Nepal and per capita availability is presented below. It is revealed that productivity of these crops is low and per capita availability is also at low level. The production and availability of millet is higher than other crops. But this is very low considering their potentialities in terms of supply and nutrition. The total supply (kg/caput/year) is also declining over the years (Figure 11).

The farming systems have largely been oriented towards subsistence living. Indigenous food systems have also been obliterated (demolished/destroyed), and regions where indigenous populations dominate have largely been food insecure, and where malnutrition is widespread (Adhikary et al., 2020).



COVID-19 Impacts

The lockdown and transport restrictions have severe consequences to different sectors, communities, and groups in Nepal. This crisis has differential impacts to the subsistence and commercial/ semi-commercial farming. As the traditional farming appears to be somewhat resilient compared to commercial farming, more impacts are observed in the case of commercial farming which is limited to the periphery of market centres, cities, and emerging towns and in the accessible areas. Due to the lack of resilient supply networks to reach even the local market, the supply of products to the markets was obstructed. Lower resiliency of commercial farming was also evident because of its growing dependence on inputs (mainly seeds and fertilizer) on distant markets located in foreign countries. The observation of this crisis for a about a year unleashed by the pandemic clearly revealed that wage labourers, indigenous people, and women from marginalized groups and regions already vulnerable in food security and malnutrition suffered more due to COVID-19 as they lost both external support and the coping mechanisms (Adhikari et al., 2021).

The COVID-19 pandemic has heavily impacted the marginal and small farmers in Nepal, affecting production, marketing, and food supply systems. The lockdown and transport restrictions have also impacted food consumption. These disruptions have changed people's diets and their ability to carry out various agricultural practices. Seasonal agricultural workers have not been able to reach the farms, leading to a shortage of labour and significantly impacting agricultural operations. This threatened the harvesting of crops (resulted in delay harvesting). Similarly, the farmers were scrambling to get harvesting machines, while being compelled to destroy perishable produce such as vegetables, which they are unable to sell due to restrictions on vehicle movement. Women farmers were the most affected as they have even less access to resources and agricultural extension services than men (CDKN, 2020).

MSMEs both formal and informal were hit hard by the Covid-19 as they tend to have low cash-to-asset ratios. It was found that three in five employees lost their jobs in the micro- and small businesses and those businesses experienced a fall of 95 percent in average monthly revenue. It was reported that 28 percent of men lost their jobs during the lockdown, compared to 41 percent of women. While 31.5 percent of the total workers lost their jobs, 74 percent were not been paid since the lockdown started. Increased responsibility at home due to closure of schools and day care affected working mothers (UNDP, 2020).

Underlying Drivers for Unsustainable Consumption Pattern

There may be many drivers that contribute to the existing food environment, unaffordability of healthy diets, triple burden of malnutrition and food chains. Some of them are presented as follows:

- Unregulated market for commercial food products resulting in unhealthy foods and expensive commercial food products are reaching to rural and inaccessible areas as well due to aggressive marketing.
- Legislation on mandatory labelling on the nutritive value of food and portion size is not available in the commercial food products, resulting that the consumers are misinformed and misled about the quality of food that they purchase. No availability of essential nutrition package focusing on middle aged children/ adolescent girls, resulting these group of children are easily attracted towards unhealthy food due to poor knowledge about nutritious food and source of nutritious food for them at various service points- schools, community, and family.

- Social, religious, and cultural aspects such as women in far-west not allowed to take green and dairy products during menstruation cycle when they require nutrition the most.
- Globalization, urbanization, migration, and other socio-economic drivers changing the demand and consumption of nutritious foods.
- Inadequate infrastructure for physical access and value addition (physical infrastructure, storage) for connectivity.
- Government subsidies on food commodities as a form of social protection, but they are not aligned with dietary guidelines.
- Loss/ Erosion of local biodiversity and poor dietary diversity, and low education/ awareness on the nutritive value of underutilized crops.
- Policies that favour energy-dense foods of minimal nutritional value over nutritious foods and lack of resilient value chains and marketing system.
- Inadequate and weak policy coordination and coherence on, or practices among the concerned ministries such as MoALD, MoHP and MoEST.
- Poor/lack of incentive to diversify food consumption and genetic diversity maintenance, inflated advertisement/promotion about the value of food in media (e.g., Ultra-processed foods)
- Absence of national dietary guidelines for all age groups.

Key Propositions, Pathway, and Game Changing Solutions/Actions

Proposition: Enabling, inspiring and motivating people to enjoy healthy and sustainable consumption options; Slashing food loss and waste; and transitioning to a circular economy through advancing in technological, environmental, economic, social, regulatory, and institutional fronts.

Pathway: Set up regulatory mechanisms and educate people to consume healthy and nutritious local food, reduce food loss/waste, and promote, protect and support for breastfeeding practices.

Game Changing Solutions/Actions

- Unhealthy processed food products are cheaper than healthy alternatives and are easily available in the markets. For this, adopt financial measures such as taxes on certain food products, tax related to carbon footprint and subsidies for healthy food products, and income transfers delivered via social protection schemes.
- Educational curricula do not adequately incorporate or address the nexus of biodiversity-climate-food-health system resulting in a lack of knowledge across society regarding the impacts of dietary choices. The formal and informal educational program should address by preparing a science-based standardized material for school feeding, community level information campaigns etc.
- Implement nutrition sensitive agricultural policies can best be utilised to encourage the production and consumption of a wider variety of locally available and culturally acceptable nutritious foods.
- Majority of the public are unaware that their diets have an impact on the environment. Food labelling information is often presented in confusing and unhelpful ways with attractive packaging. It is not easy for consumers to decide and differentiate what should be part of a healthy diet produced through sustainable food systems. Hence, nutrition related information and eco labelling should be made for helping consumers to make informed choices, thereby promoting healthy diets.

- It is necessary to create a breastfeeding-friendly environment at workplaces, health systems and community settings. For this, it is required to revise/update national guideline of MIYCN to create maternal baby friendly environment at workplace, health system, public places, and community setting.
- Losses of the foods items happens in different places such as at home, restaurant, hotels, and party palaces. Cooking loss, spoilage during preparation of foods before cooking and lack of diverse menu, the food system is also highly impacted. Therefore, reducing losses and waste could improve food availability without having to expand production. Hence, organize a campaign of zero food loss to ensure access to food and zero hunger and also establish right to food and food security monitoring system, to ensure right to food.
- The consumption increase of unhealthy diets are the result of the excessive marketing and promotional campaigns. The public authorities monitoring system is very weak. Hence, it is necessary to devise regulatory measures by the public to reshape the consumption of healthy diets.
- Food-based dietary guidelines do not consider the issues of environment, food waste, affordability, local foods etc. FBDGs should be prepared jointly by MoHP, MoALD including DFTQC coordinated by NPC considering scientific facts, customized to the local situation and considering sustainability as well as health concerns.
- Implement FBDGs that promote nutrition of early childhood, middle childhood, and adolescent such as engagement in School Meal Coalition for institutionalizing access to diversified food to school children as well as maternal nutrition.
- Raising awareness and understanding of the value and implications of improved choices, and stimulating demand for nutrient-rich foods, and prepare essential nutrition package focusing on middle aged children/ adolescent girls and boys.
- Develop a forum (appropriate ecosystem to collaborate) for food systems stakeholders (policy makers, academia, private sector, civil society) to drive positive change together. Also create healthier food environments and promote healthy (sustainable) diets and to reduce malnutrition in all its forms.
- Develop technologies and infrastructures, and norms and mandatory guidelines for post-harvest handling of foods to reduce food waste.
- Promote regenerative agricultural production system to produce healthy foods and adopt measures to conserve & utilize local crops/commodities that have high nutrition.
- Ministries such as MoALD, MoHP and MoEST could collaborate and forge partnership on promoting Home Grown Food produced by smallholder and women farmers, which could potentially go to the menu of School Meal Programme nationwide. In this regard, they can disseminate message about its importance in terms of improving nutrition and reducing the cost.
- Enforce and monitor the implementation of Breastmilk Substitute Act; increase maternity and paternity protection to at least 6 months with full salary, so that mothers can breastfeed, and fathers can support in the care and nurturing of children.
- Invest in lactation management skills and competencies for health care workers and establish human milk banks in Kathmandu and provincial hospitals.
- The school meals programme has contributed to the nutrition of the school aged children and reduction of cost of nutritious diet by household. Given its importance, this program should get support from all the governments for its continuity in Nepal.

- Home-grown school feeding (farm to school menu) should be considered as a priority approach. This approach would facilitate the marketing of locally grown foods for about 2.9 million school children in every school day with low cost and high nutrition. The local producers would have markets to sell their products and can supplement to their household income. Such approach can serve as a market for both producers and consumers and promote the production of locally feasible/potential commodities.
- Explore how the private sector can be encouraged to engage throughout the food systems for increasing production and supply of nutritious food, increase income of the famers as well as drive demand for healthier diets that promote human and planetary health.

Assessing the success of Action:

The implementation of above game changing solutions/actions should be outcome oriented that transform the unsustainable consumption pattern into a sustainable one. The important options for assessing the actions being successful should include the followings.

- Effective Monitoring and Evaluation in the use of local storage facilities, creation of agro-based employment and the level of post-harvest losses in foods.
- Assessing the accessibility of consumers in subsidized price shops and the effectiveness of local food processing centers.
- Monitoring the trend of market prices (rise and fall), evaluating the effectiveness of food security indicators.
- Social/public auditing of the implemented programs, database management and development of M&E system and indicators.
- Strengthening the capacity of food inspector and seed inspector.
- Availability of Provincial Land Act, and availability of land and other socio-economic data base.
- Availability of regulation to promote healthy food and discourage the sale and distribution of ultra-processed foods.
- Effective implementation of food Acts and regulation and preparation of food standards (such as labelling, quality indicators testing, GMP sticker etc).
- Access to markets and storage, creating a framework for participatory monitoring and evaluation.
- Development of Food management information system and identification of key indicators for quality food system.
- Dedicated public institutions for post-production handling of food products, social auditing and public hearing program implemented, and management of trained human resources.
- Regular reporting and feedback mechanism, Research and continuous studies.

Collaboration/Partnership and Roles/responsibilities of Governments and Food System Actors:

A strong coordination and collaboration among diverse food system actors (public, private, NGOs/CBOs, Farmers' organization etc.) are essential for shifting to food consumption pattern to a sustainable pattern. The specific suggested roles and responsibilities of the federal and provincial and local governments and other food system actors are outlined below.

Federal government:

- Formulation of policies and Acts and Regulations, budgetary support to province and local governments.
- Support to province and local levels and expansion of school feeding program up to the 8th class.
- Transformation for sustainable consumption of foods through the collaboration of three tiers of governments.
- Wider sharing and dissemination of policies among the stakeholders.
- Collection and management of statistics and information by the local government and request for needed support from the province.
- Identification of production pockets by the local government.
- Promote drip irrigation system in rainfed/water deficient areas.
- Carryout demand-based research and studies.

Provincial government:

- Formulation of polices and regulations, their documentation and implementation.
- Formulation of polices and regulations, and their documentation and implementation.
- Land use and environment friendly policy promotion.
- Establish Provincial Health, Social Development and Education Authority.
- Support for the development of infrastructures.

Local government:

- Implementation of policies and regulations and documentation.
- Mobilization of local farmers for sustainable production of foods.
- Development of policy guidelines, policy and program implementation and awareness raising.
- Implementation of policies and regulations and their proper documentation.
- Identification of food insecure and vulnerable households and data collection.
- Distribution of Below Poverty Level card and implement awareness raising programs.

Private sector:

- Investment in food industries, and ensuring the supply of quality food products.
- Insurance of crops and livestock-Federal and provincial.
- Produce raw materials required for the agro-based industries.
- Marketing, branding, processing of local product, sell the commodities at a reasonable price.

Action Track 3: Boost Nature-Positive Food Production at Scale**Context**

Current food system is not functioning well to produce quantities of food to feed and ensure food and nutrition security of growing population without damaging natural resources and environment and to benefit everyone equally and equitably under changing climate and economic system. Globally, estimates show that the current food system is responsible for a third of greenhouse gases emissions, 80% of deforestation, 70% of terrestrial biodiversity loss, and has been linked to a dramatic rise in our exposure to zoonotic diseases, such as Ebola, SARS, and COVID-19 (WWF, 2021). Therefore, a healthy future requires us to halt and reverse biodiversity loss and limit climate change while meeting the

fundamental human right to healthy and nutritious food for all. The challenge ahead is also to improve our food production systems without exceeding the carrying capacity of ecosystems and the planet. It is only possible to achieve this by transforming our food systems and adopting nature-positive production practices at scale and within planetary boundaries.

To address these challenges, the goal of Action Track 3 is to boost nature-positive production¹ at scale to globally meet the fundamental human right to healthy and nutritious food while operating within planetary boundaries. Nature-positive food production systems are characterized by a regenerative, non-depleting and non-destructive use of natural resources in food production system. It focuses on environment friendly food and feed production system that ensure biodiversity, conserve soils and water, reduce pollution and enhance climate resilience and social stability. In its pursuit of this goal, this will aim to deepen understanding of the constraints and opportunities facing smallholder farmers and small-scale enterprises along the food value chain. It will also strive to support food system governance that realigns incentives to reduce food losses and other negative environmental impacts. The framework of:

Action Track 3: boosting nature-positive food systems includes 3 action areas outlined below.

Action Area 3.1 Protect natural ecosystems from new deforestation and conversion for food and feed production

Action Area 3.2 Manage sustainably existing food production systems

Action Area 3.3 Restore degraded ecosystems and rehabilitate soil function for sustainable food production

The framework for nature-positive food production system is presented diagrammatically in Figure 12.

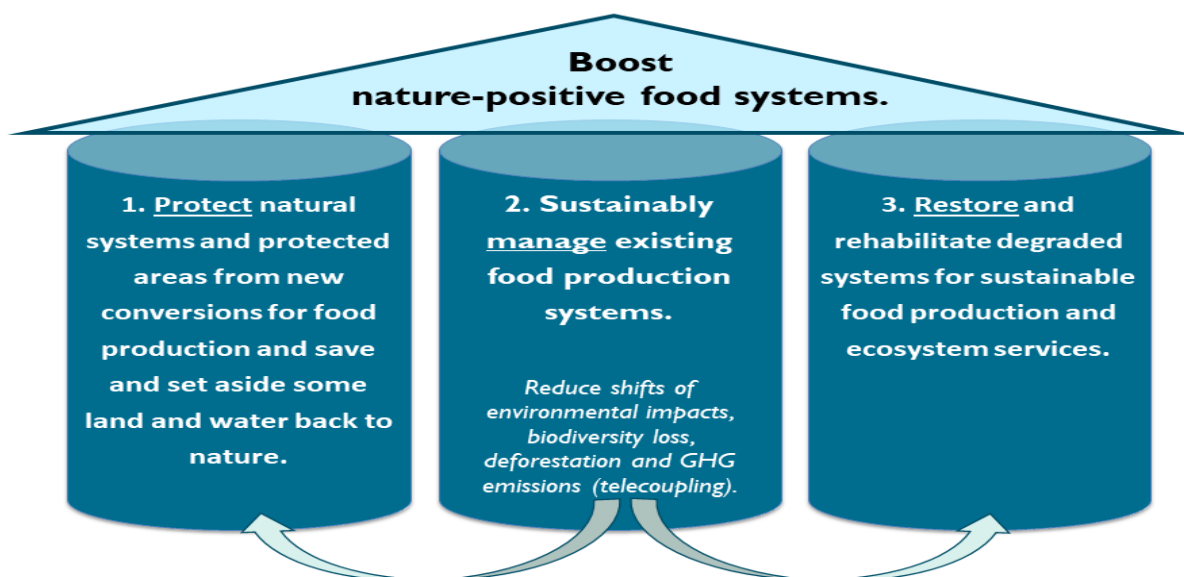


Figure 12: Framework to boost nature-positive food systems

Action Area 3.1 Protect natural ecosystems from new deforestation and conversion for food and feed production

¹ Nature positive production is a form of food production that is characterized by regenerative practices that manage soil and water and enhance biodiversity. It is the non-destructive use of natural resources that protects and builds upon natural and social capital.

This Action Area aims to propose ways and means to safeguard natural ecosystems (on land, water, forests) and ensure that they are not converted for food and feed production. It aims to eliminate deforestation, conversion and overfishing from food supply chains. Key areas of work include redirecting agricultural subsidies and other agri-food supports towards the payment for delivery of ecosystem services; social safeguards; the development of (new) legislation and governance mechanisms; trade (via a Codex Planetariums) working with indigenous and local communities (especially the most vulnerable) to secure their rights (notably access to land, water, and genetic resources), with particular regard for rural women.

Action Area 3.2 Manage sustainably existing food production systems

This Action Area will design nature-positive and context-specific solutions that will: increase input efficiencies; internalize externalities; increasing yields within planetary boundaries; stimulate agrobiodiversity to reduce pressure on ecosystems while improving nutrition, livelihoods and enhancing resilience to climate change. Since there are no one-size-fits-all solutions, we embrace all nature-positive approaches, from digital farming to traditional and indigenous knowledge and seek to enable farmers and fishers to design nature-positive solutions for their own geographies and socio-economic contexts. Key areas of planned work include agroecology and other regenerative practices; agrobiodiversity; sustainable livestock production; sustainable and resilient 'blue food' production systems; traditional and indigenous knowledge in food production; gender inclusion to improve the management of food production systems.

Action Area 3.3 Restore degraded ecosystems and rehabilitate soil function for sustainable food production

This Action Area will rehabilitate degraded and underperforming ecosystems (in soil, freshwater bodies, forests) so that they can be brought back to life to generate ecosystem services, including those that support sustainable food production. Key areas of our work include improvement of soil health to sequester and store carbon; policies and finance that scale up restoration efforts in land and water; innovative and appropriate governance mechanisms.

Analysis of Nepalese Food System

Problems and Issues

Land degradation, land fragmentation, land use changes particularly unplanned conversion of fertile agricultural lands into settlements, industrial and other non-agricultural uses, loss of biodiversity, deforestation and pollution are major challenges and issues for unsustainable production system. Depletion of soil nutrients, and reduction in soil organic matter, soil compaction and soil erosions are the major types of land degradation witnessed in Nepal. Loss of topsoil have occurred from soil erosion, landslides, and poor management because of conscious and unconscious anthropogenic activities (Chalise et al., 2019). Un planned construction in sloping upland in the hills and mountains without due consideration given to environmental issues are responsible for land degradation (IUCN, 2018). According to MoEST (2008), about 3.16 million hectares (11.81% of the total area of Nepal) have been affected by the degradation process with 38% of forest lands, 37% of pasture/rangeland and 10% of agricultural land. There is a rapid conversion of premium agricultural land for industries and urban development in Terai, river basins and valleys and land abandonment in hills and mountains with increased urbanization, migration and socioeconomic changes. The urbanization process in Terai during the recent decades is taking place at around 12%, implying that about 65,000 ha of premium

land suitable for cereal cultivation has been converted into urban areas (Rimal et al. 2018). Increasing land abandonment (fallow land) is also a serious and growing problems in Nepal recently as it poses multiple threats related to food insecurity, loss of rural livelihoods, reduction in crop production, loss of biodiversity and soil productivity, and damages to the ecological landscape (Pandit et al. 2021). Some studies indicate that on average 37% of arable land is abandoned in Nepal (Paudel et al. 2014; Ojha et al. 2017). Estimates show that almost 21% of *bari* land (upland) and 5% of *khet* (paddy) land in hills and mountains have been abandoned mainly due to youth outmigration. Further, around 70% of farming households have been underutilizing their cultivated land resource in the middle hills (K.C. and Race 2019).

Loss of biodiversity in agriculture is rapid in Nepal due to land use changes, invasion of alien/exotic species, use of narrow range of exotic modern varieties and animal breeds without giving an adequate consideration to local and indigenous crop varieties and animal breeds. Estimates show that the country has already lost 50% of the traditional crop varieties in the past six decades of agricultural development (Gauchan, 2019; Joshi et al. 2017). Human actions, such as, excessive use of chemical fertilisers and pesticides, unsustainable farming, overgrazing and deforestation have also led loss of biodiversity (Chalise et al., 2019). Environmental pollution (soil, water, air) is also emerging as a major problem in agri-food system in Nepal. Due to agricultural intensification and misuse of agrochemicals, water pollution is the most serious environmental issue in Nepal and agriculture is one of the main sources of water pollution (Bhattarai and Dahal, 2020). Although overall use of chemical fertilisers and pesticides are low in Nepal, however, in specific areas, particularly vegetables and cash crops growing areas, overuse of chemical fertilisers and pesticides is common and adverse effects on plant, water and soil impacting negatively on health of human and aquatic life (MoEST, 2008). In addition, cultivation of crops on steep slopes without adoption of scientific conservation is contributing to increase water turbidity and pollution affecting human and aquatic life (Acharya and Kafle, 2009).

Nepalese farming systems and crop production is deeply interconnected with climate variables such as precipitation and temperature largely because agriculture is predominantly rainfed, thus affecting overall food system functioning. Studies show that climate is changing in Nepal with increased warming. A recent study by Department of Hydrology and Meteorology (DHM) Nepal on observed climate trend analysis for the period of 1975- 2014 suggests a significant increasing trend in annual maximum temperature data at the rate of 0.056 oC/ year (DHM, 2017). Though there is no very clear trend in the precipitation during this period (1975-2014), some studies show increasing trend of rainfall (MoFE, 2019). Therefore, climate change impact has impacted negatively with increasing incidence of extreme rainfall events, flooding, landslides, droughts and disease and pest outbreaks. Increasing dependence on fossil fuels in agricultural production, transportation, storage and other supply chains has impacted negatively on environment and human health. Globally, livestock is one of the major contributors of Green House Gas (GHG) emission in agriculture with an estimated 18% of human caused GHG emissions comes from livestock (HSUS, 2008). The GHG emissions values for Nepal equals about 23% of total national gross GHGs emission per annum in terms of CO₂ equivalent due to poor management of livestock (Bajagai, 2012). These high figures might be due to country's high livestock population density with 4.3 livestock /hectare, which are not properly managed. Small and marginal farmers are more vulnerable to climate change due to limited options for diversification to food production (Joshi and Joshi, 2019). Climate change has also some positive effect due to

warming of temperature which has resulted in increased cultivation of lowland crops in higher altitudes of the mountain region.

Drivers of Unsustainable Production System

Due to dominance of small marginal and fragmented land holdings, difficult and fragile mountain topography, climate change impact coupled with limited technological options, high cost of production and poor governance, maintaining and promoting nature positive production is challenging for Nepal. The major barriers and drivers to achieving nature positive production system are briefly outlined in five major categories below.

1. **Climate change impact:** Climate change has both negative as well as positive effects on food production systems. In Nepal most of the effects are considered as negative. Climate induced disasters have significant impact to national economic and social development of the country with direct cost of these events equivalent to 1.5– 2% of current GDP/year at 2013 prices, and as much as 5% in extreme years (MoPE, 2017). Climate induced disasters such as flooding, drought, extreme rainfalls, disease and pest outbreaks have affecting food production negatively. Evidence shows that about 99% of the people perceived increased drought in the last 25 years, 98% observed increased disease and insects, 85% observed delayed rains and 78 % observed increased landslides (CBS, 2016). Nepal is one of the most climate vulnerable country as per the report of Global Climate Risk Index, which ranked Nepal as the 9th most climate vulnerable country in 2018 (Germanwatch, 2020). However, country lacks adequate technologies, capacity and policy commitment to address climate induced disasters.
2. **Socioeconomic change:** Socioeconomic changes brought out by youth migration, change in food habits (food culture) and urbanization have affected food production systems. Increasing youth migration has resulted in land abandonment and scarcity of agricultural labor in rural areas resulting in decline in eco-friendly food production and increased land degradation. Land abandonment is a major issue in the rural areas particularly in the hills and mountains. Recent studies show about 37% of land remaining fallow in Nepal (Paudel et al. 2014; Ojha et al. 2017). Urbanization and increase shifts towards consumption of narrow diversity of high energy rich processed foods have resulted in production of few major food staples with excessive input use resulting in poor nutrition and unhealthy food system. Use of narrow genetic base MVs/technologies, exotic hybrids, GMOs etc. are causing widespread loss of indigenous genetic resources (biodiversity) and promoting chemical use and soil nutrient mining. Poor market price control mechanism, unstable markets and lack of food safety are also major socioeconomic issues driving poor functioning of the food system.
3. **Land degradation and land use changes:** Unsustainable use of land particularly through unplanned conversion of productive agricultural land into infrastructural development, settlements and unscientific cultivation in the hill and mountain slopes have resulted in land and natural resource (forest, water) degradation. This haphazard expansion of agricultural land is increasing deforestation, loss of biodiversity and land degradation making vulnerable to climate disasters – droughts, landslides, soil erosion. Land fragmentation and land abandonment are increasing resulting in declining agriculture production. Slopy land cultivation with improper drainage and poor land management causing soil erosion and landslides particularly in the Hills

and mountains. Poverty of households is also triggering cultivation in marginal lands, land encroachments, forest encroachment, slums and riverbanks encroachment. Poor management of livestock and open grazing system are also resulting in degradation of lands and vegetations. Subsidies on agrochemicals particularly in fertilizers (mainly in urea) resulting in haphazard use as well as unbalanced use resulting in deficiencies of some macro (e.g., P & K) and micronutrients (e.g., Zinc) and soil and water pollution.

4. **Unsustainable intensification of production system**: Homogenization, modernization, and simplification of food production system as well as excessive use of chemicals has reduced loss of biodiversity (indigenous crop varieties, predators, diverse flora, fauna) that have increased disease and pest epidemics (bird flu, swine flu, locusts, army worms etc.) making small food insecure farmers vulnerable to food insecurity and livelihood. Extensive use of water (ground water irrigation) for agriculture is making depletion of water table resulting in water scarcity for increased and resilient food production. Continuous cropping of narrow diversity of major food staples and modern varieties without legume rotation, conservation agriculture, agroforestry practices and lack organic fertilizer supplementation has resulted in loss of crop biodiversity, reduced soil fertility, soil erosions in the hills and mountains and ground water depletion. Declining soil fertility with continuous monocropping, soil erosion and poor soil management are promoting degradation of farmlands leading to reduced crops productivity (Chalise et al. 2019). Unsustainable production practices are resulting in forest fires, slash and burn practices that have triggered loss of biodiversity, food insecurity and livelihoods of forest dependence communities.
5. **Weak Institutions and Governance systems**: The country is still in transition towards federal system, where three tiers' governments are yet to function fully. There is a weak vertical and horizontal coordination among different sectoral government institutions during program planning and implementation. The new formed Agricultural Knowledge Centers (AKCs) in the Provinces and Agricultural Offices at the local level are weak and not functioning well due to lack of adequate human resources and their proper linkages with federal Agricultural Development Agencies, Agricultural Research Centers of NARC and other agriculture and food related actors. Despite having formulated some good policies and legislation in land (e.g., Land use policy and Land Act), agriculture (e.g., ADS) and food related issues, they are not implemented well due to weak institutions and governance system. There is also lack of proper communication and coordination among national research of NARC, Agricultural Universities, Agricultural Knowledge Centers (AKCs) and local agricultural extension of local Government resulting in poor flow of improved knowledge, technologies, and information for nature positive agricultural production system. Country also lacks reliable data base system and research to general data and information system in nature positive production system in close partnership with diverse public and private sectors and actors.

Key Propositions, Pathway, and Game Changing Solutions/Actions

Proposition: Protect natural ecosystems from new deforestation and conversion for food and feed production; manage sustainably existing food production systems; restore degraded ecosystems and rehabilitate soil function for sustainable food production.

Pathway: Agroecosystem based resilient planning and revitalization of indigenous food systems, and concentrated efforts on conserving and using the biodiversity and nature by improving the value of nature positive food system

Game Changing Solutions/Actions

The suggested action points **for boosting nature positive production system** are briefly outlined below.

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- Adoption of Climate Resilient agricultural system: Develop and promote climate resilient villages and food system with climate resilient agricultural and animal husbandry technologies; adopt climate smart policies and plans.
- Enforcement of Land Use Act (2019) and Land Use Policy (2015) to minimize land conversion and degradation
- Agroecosystem and Landscape based planning focusing on local comparative and competitive advantage
- Regenerative agriculture production system with focus on ecological, organic and conservation agriculture.
- Revitalization of local indigenous food system and social system utilizing traditional wisdom and culture.
- Conservation and sustainable use of agrobiodiversity by promoting site specific crops, NUS and community seed banks.
- Organic /ecological farming and marketing with the development of organic technologies and policies.
- Improvement of soil fertility through legume rotation, conservation agriculture, green manuring and agroforestry promotion.
- Value chain development of local crops /commodities in partnership with private sector.
- Better management, restoration and improvement of agroecosystems (land, water and soil) and their better utilization.
- Management of livestock and pastureland with focus on agroforestry /integrated farming systems
- Investment in food-water-energy-biodiversity-health nexus.
- Land use planning enforcement for optimum and productive use of land by addressing better management of land through land pooling, unused fallow land, under used. misused and exploited land beyond carrying capacity.
- Restoration of degraded agroecosystem; convert degraded riverbeds to gardens; water shed conservation
- Promotion of Good Agricultural Practices (GAPs) for production of agriproducts to be supplied under Home Grown School Feeding and intensify the GAP certification facilities/mechanisms .
- R & D investment in green and climate smart technologies and innovations for sustainable nature positive production system.
- Value chain and market development of biodiverse nutritious foods from farm to fork including storage/cold chain using climate smart technologies and practices.
- Subsidies and safety nets to resource poor small and marginal farmers to prevent forest encroachments.
- Removal of subsidies for unhealthy /agrochemical intensive food production system.

- Build the capacity of farmers, private sectors and R &D stakeholders in nature positive production program implementation with inclusiveness of women, youth and marginal groups.
- Establish a comprehensive agricultural information, knowledge, database, and services systems including market and agrometeorological information center and build capacity of farmers and stakeholders.
- Improvement in capacity of the stakeholders in governance agri-food system and natural resource management (land, water, soil, forest) among three tiers governments.

Assessing the Success of Actions:

The focus of the implementation of above suggestions actions and programs should be outcome oriented that enhances food and nutrition secure and healthy ecosystem and land degradation neutrality (no land conversion) and no loss of local agrobiodiversity (documentation of local agrobiodiversity). There is a need of improvement in political will and commitment to reduce land conversion and degradation as well as reduction in loss of biodiversity and restoration of ecosystem services. The important identified options for assessing the actions being successful should include followings.

- Inclusion of nature positive food production system in periodic and annual policy plans and programs of the federal, provincial, and local governments.
- Allocations of timely budgets and mechanisms for implementation of policies and programs in 3-tiers governments.
- Regular monitoring and evaluation and feed-back collection mechanisms on nature positive production programs and activities of the provincial government.
- Annual and quarterly review of nature positive production programs and activities implemented by the three tiers governments.
- Human resources development and strengthening their capacities in nature positive production system.
- Research focus on ecological and organic technologies, such as organic soil management, organic/bio-pesticides and nature-positive production system.
- Establishment and operationalization of relevant institutions related to biodiversity management and nature positive production management.
- Well established coordination mechanism developed among federal, provincial, and local levels as well as other private civil society food system actors.
- Development of feedback mechanisms with indicators-based tracking system for implementation of food and nutrition security and ecosystem-based policies, programs.
- Develop a master plan for regenerative /ecological organic based farming system.
- Production, market, and climate information services to farmers through early warning system and preparedness.
- Availability of agro-advisory climate services and information systems such as early warning and prepared plans and programs including market services to farmers and stakeholders.

Collaboration/Partnership and Roles/responsibilities of Governments and Food System Actors:

Linkages and coordination among diverse food system actors such as private sectors and 3 tiers of government are essential to ensure proper planning for nature positive food system development. The specific suggested roles and responsibilities of the federal and provincial and local governments and other food system actors are outlined below.

Federal Government: International cooperation, coordination and linkage for donor funding, policy development and resource generation for nature positive production system; develop policy guidelines for natural resource system management; climate regulation act to reduce GHGs emission; national policy on awareness and education about nature based production systems; national policy and legal framework on documentation and registration of native agrobiodiversity and natural resources; policy and programs to linking production systems with agro-ecotourism and health; development of land use regulation and land bank guidelines and directives; low-Carbon emission economic development strategy formulated and implemented; R & D investment in improvement of soil & nutrient management, livestock husbandry practices, paddy production practices for reducing GHG emission, agroforestry, integrated farming using green technologies (low carbon foot print). NARC- strengthened/empowered to be truly autonomous- It should focus towards all 3 tier government to develop and promote new green agricultural technologies for nature positive production system: development of policies for agricultural insurance and minimum price support programs.

Provincial Government: Strengthened Agricultural Extensions- through Private- public partnership as per provision of Agriculture Development Strategy (ADS); strengthening Agricultural Knowledge Centers (AKCs) to focus on technical services rather than subsidy focus at the provincial and local level.; Integrated land use plan developed and implemented at province level; development of operational guidelines for land use plans, land banks and ecosystem restoration programs for natural resources; mainstreaming agrobiodiversity, organic farming and climate smart agriculture by developing master plans, policies and programs; development and operationalization of course curricula in universities, colleges and schools in nature positive Agri food system development, agrobiodiversity and climate smart agriculture; effective monitoring of implementation of agricultural insurance and minimum support prices with buy back guarantee scheme to enhance market assurance;

Local Government: Strengthened agricultural extension services through public-community-private partnership such as community agriculture extension Service Centers (CAESC) as the provision of Agriculture Development Strategy; awareness and education about nature based production systems at the local level ; documentation and registration of native agrobiodiversity and natural resources; Establishment and strengthening community seed banks and food banks for promoting seed security and food security at the local level; development of incentives and taxation system for land use to reduce land abandonment /fallow land; local seed system strengthened through establishment of functional community seed banks; implementation and scaling up of program and models developed by provincial government; regular monitoring and reporting and data collection and management at local level; establishment of fair price shop for local supply chain development for local foods in all the municipalities;

Private sectors including NGOs: Support three tiers of governments for policy and programme implementation; collaboration with federal, provincial and local governments for program monitoring and evaluation; engage in value chain development and promotion of agriculture produce (processing and marketing) at the local, provincial and national level; support in scaling up and promotion of new technologies, improved seeds, breeds, inputs and practices; support in the marketing of local indigenous organic products at the local, provincial and national level.

Action Track 4: Advance equitable livelihoods

The problem: Inequality and power imbalances – at household, community, national and global levels – are consistently constraining the ability of food systems to deliver poverty reduction and sustainable, equitable livelihoods (UN, Action Track Discussion Starter, 30 Nov 2020).

Vision: The vision is to attain food systems that are inclusive and diverse, and which contribute to the elimination of poverty and food and nutrition insecurity by creating jobs, raising incomes across food value chains, protecting, and enhancing cultural and social capital, reducing risks for the poorest and increasing value distribution (UN, Action Track Discussion Starter, 30 Nov 2020).

Context in Nepal

In Nepal, 66% of the population engaged in agriculture, out of which more than 70% are of women. Moreover, many landless, smallholders (SHs), women, Dalits, indigenous people rely on agriculture and forest-based foods and their livelihoods. Unfortunately, many of them are unrecognized, unremunerated, underpaid and or preference of services as well as wage rates differ by gender. These group of people and associated food system is constantly being vulnerable and unsustainable due to lack of equitable access to means of livelihoods such as infrastructure, services, technology, financial resources for investments, skills and knowledge and their inhabitation in the marginal and or fragile areas from natural disaster point of view. Additionally, the deep rooted social and economic inequalities in employment opportunities increase vulnerability and denial of human rights of all actors specially of women and indigenous people, small holders in the value chain for their employability, income and livelihoods security. Moreover, discriminatory legal system, inadequate institutional mechanisms and limited capacity of women, people in remote areas, small holders, old-age, people with disability (PWD), internally displaced people (IDPs) etc. have weak position to claim their rights, have less access to production resources, space for voices, bargaining power in markets and trade, is in fact a denial of their constitutional rights and entitlements.

In terms of access to and control over resources, despite of over 70% women managing agricultural tasks, only 32% women has formal ownership over property which directly impacts on agricultural productivity, their participation in policy processes, access to financial resources and accessing services as well as negotiation capacity with the market players.

The increasing trend of youth migration has led to feminization of agricultural task. Women are taking additional burden of farm management in addition to their care work. However, the property rights are not shared or disproportionately shared to make them comfortable to identify them as legal owner of the farm and claim their farmer's rights. Almost 26% households are female-headed in Nepal but

very less and scattered targeted programs are implemented to address their concerns, priorities and needs in ensuring food security and equitable rights to food.

In the recent years, food and agriculture related enterprises and business are increasingly being managed by women and associated cooperatives and networks. There are almost 11,000 women entrepreneurs functional in Nepal. However, women's access to financial resources and market expansions in both domestic and export arenas are not fully exploited due to lack of initial investments, inadequate family support, non-cooperation from the financial institutions, and making appropriate use of information, communication, and technologies (ICTs).

While looking into the infant and children specific nutrition and food supplies, it is very crucial to regularize the food supplements along with the regular diets for girls, pregnant, and lactating women in different societies according to their cultural practices and preferences. The Bill for the amendment of Act on supplementary foods in replacement of mother's milk, 2049 has provisioned for the "human milk fortifier" for the infant below 34 weeks. Moreover, it has specified the need of proper labelling on the supplementary products, for e.g., minimum of 40% coverage with importance of mother's milk, no distorting messages that the supplements are better than breast feeding, quality approved by the Department of Food Technology and Quality Control (DFTQC) and recommendations by health workers only beyond medical conditions (MoHP, 2021). This shows that infant care is equally important aspect of nutrition management within the food system discourse.

Moreover, natural calamities and pandemics such as Covid-19 is disproportionately impacting marginalized people such as women, children, old-age, people with disabilities, internally displaced people (IDP), small holder farmers and agriculture wage workers. According to the study report of the Ministry of Agriculture and Livestock development (MoALD) and World Food Program (WFP) in 2020, 87% households (HHs) affected from food insecurity in certain ways. Among the suffering population, 52% are of agriculture wage workers. Likewise, women headed households suffer more than male headed (MoALD, WFP, 2020). With the prolongation of crisis, the poor, disadvantaged, women, girls are pushed further to vicious circle of poverty and deprivation leading to food and livelihoods insecurity. Globally, there is also an increasing prevalence of food insecurity among women compared to men due to COVID-19 with 10% difference in 2020 against the rate of 6% during 2019. It is also evident that the situation of child stunting, exclusive breast feeding, anemia among women of reproductive age is worsening (FAO et al., 2021).

Likewise, there are geographical disparities in terms of their socio-cultural practices, economic wellbeing, caste and ethnicities, education level as well as production potentials and dependency on market supplies. For example, incidence of stunting of children below 5 years is highest in Karnali province. Likewise, the households with lowest quintile suffer from nutritional security are of 49.1% against the households under highest quintiles with 16.4% only. Caste and ethnicity wise, newar community has 21.4% only against the rate of 41.9% among terai/madhesh communities. Families with higher education has 22.8% against the illiterate group with 45.7% incidence of nutritional insecurity (MoHP, 2020). Moreover, Province 1 and Bagmati province were the ones who are mostly depending on market supplies for food supplies suffer differently than others.

Despite those backdrops, there are some potential threats for promoting inclusive livelihoods and equitable access to food by all. The commitment of global actors as well as Nepal Government towards Leave No One Behind (LNOB), the Constitution of Nepal, 2015, the Right to Food and Food Sovereignty Act, 2018, Gender Policy, 2021 and some targeted provisions in different policies of Nepal are few examples to gear towards equitable access to productive resources, employment, income, and sustainable livelihoods. Unfortunately, the LNOB index of Nepal shows that Nepal is not ready for two of the indicators such as policy for equal access to employment, land and health as well as finance for education, health and social protection. However, two of the indicators such as overall LNOB readiness score and outcome score for under five mortality rate and under nourishment etc. are in partial progress (Chattopadhyay and Manea, 2019).

Pillars: The action track four encompasses six major pillars namely: i) Production and trade, small farmers, wage laborer's income; ii) Agri industries and market; iii) Micro, small and medium enterprise; iv) Sustainable livelihoods; v) Impact of Covid-19; and vi) Inequality in access to economic opportunities, resources, gender. Additionally, there are levers of change to accelerate advancement for equitable livelihoods.

Underlying causes and key drivers

The CFS Voluntary Guidelines on Food Security and Nutrition also emphasized that gender relations and cultural norms are the key drivers for exacerbating hunger, malnutrition, and unhealthy diets mainly for women and girls. The major causes and drivers underlying for continuation of inequitable livelihoods are presented in Table 4 below:

Table 4. Underlying Causes/Barriers and Drivers.

Pillars	Underlying causes/Barriers	Key Drivers
Production and trade, small farmers, wage laborer's income	<ul style="list-style-type: none"> • Less remunerative and attractive for youths • Migration and mobility of youths and burden to women to manage care work, farm management and household food security • Weak holistic understanding of agriculture and marginalization of issues of agricultural producers, wage workers, consumers • Skewed power relation over productive resources and marginalization of women and poor in specific • Agriculture being operated as informal employment sector and poor collective bargaining power and share of benefits for the workers • Non-formalization and gender differentiated wage rates specially in agriculture sector value chain 	<ul style="list-style-type: none"> • Constitutional provisions, The RtF and FSV Act, ADS, that has ensured food for all, scientific land reforms, food Identity Cards for the destitute families, assurance of nutritious quality food during emergencies etc. • Initiatives like Zero Hunger program, Multi-Sector Nutrition program, SDG localization supports to ensure inclusive food system development • Increasing realization of niche-based production, value addition and marketing

Pillars	Underlying causes/Barriers	Key Drivers
	<ul style="list-style-type: none"> • Discrimination in employment, wage payment and distribution (e.g., subsidy to poor) and no secured employment • Rigidity in institutional provisions and response mechanisms to support poor and vulnerable. • Poor collective bargaining power of the people at the bottom of the pyramid 	<p>for better utilization, income, and sustainable livelihoods</p>
Agri industries and market	<ul style="list-style-type: none"> • Weak competitiveness with Indian products • Dominance of external market forces e.g., trade rules • Fragmented policies, regulations and • Weak coordination among key stakeholders • IPR laws and negative impacts on agri-biodiversity, biopiracy • Scattered and low volume of production to support domestic agro-industries. • WTO and other trade policies impact on agriculture and food security • Unfair competition among the domestic key players • Information asymmetry and low capacity and low level of support/protection from the govt • Lack of human resources who are genuinely interested, competent and committed to promote local seeds/foods, cultural promotions, linking local, indigenous, and nutritious foods with markets 	<ul style="list-style-type: none"> • Niche based enterprising and industrialization with mobilization of youths in specific • Climatic and physiographic diversity of the country (ecological belts) to support geographical inclusivity and local level employment creation • Globalization of local products through ICT and engagement of youths • Donor support to facilitate priority of domestic private sectors for more job creation, employment, and incomes • Quality assurance, volume for distance market, shelf life and better price • Favorable policies and legal procedure that promotes inclusive food chain
Micro, small and medium enterprise	<ul style="list-style-type: none"> • Not enough priority from the State to support and promote SMEs where most of women and poor are engaged • Weak competitive capacity of SMEs e.g., technology, finance, human resource • Weak linkage with the markets specially for the SMEs runs by women • High vulnerability due to weak capacity to deal with shocks • Poor diversification of products and stereotypic mindset while providing advices 	<ul style="list-style-type: none"> • State targeted programs on agri-enterprising run by women, youth, Dalits • Run by women/youths/marginalized • Increasing interest of financing institutions towards green policies and funding for green sector businesses, infrastructures, machines that helps in job creation through SMEs

Pillars	Underlying causes/Barriers	Key Drivers
	<ul style="list-style-type: none"> and or services to youth and women-led businesses • Lack of/inadequate harmonization of related policies on production, marketing, value addition and trade • Digital divide further discriminate women entrepreneurs to become competitive in the domestic and export markets • Impact of globalization to SMEs to be competitive for the export markets 	<ul style="list-style-type: none"> • Potential for transformation from subsistence farming to profitable business • Increasing interest groups and networks
Sustainable Livelihoods	<p>Promote five livelihoods' assets in a coherent manner</p> <ul style="list-style-type: none"> • Natural: production relation • Physical: connectivity and infrastructure • Financial: credit, economic stimulus package, business financing plans • Social: awareness and network, social pressure, image of agri-sector workers • Human resource: reverse compulsive migration for livelihoods, equip with technical expertise and specialization • Ineffective coordination among the institutions and policies related to promoting sustainable livelihoods • Provision of safety nets specially to the vulnerable groups • Weak ability to capitalize the opportunities brought by global processes e.g., WTO for better market expansion of locally produced valuable niche products • Climate adaptation and mitigation strategy with specific emphasis on disaster preparedness and inclusive response mechanisms e.g., farmers in the downstream side of Chure range 	<ul style="list-style-type: none"> • Holistic visioning of sustainable livelihoods from agriculture and inter-linkage with non-agriculture-based employment • Execution of Constitutional provisions e.g., FSV (Art 36), social justice (Art 42), land rights (Art 51) with appropriate and inclusive institutional mechanisms • Commitments to international conventions (e.g., CEDAW Art 14 on land, ILO 169) in collaboration with respective agencies such as NPC, federal and provincial Ministries
Impact of COVID-19	<ul style="list-style-type: none"> • Poverty, unequal distribution of wealth, productive resource • Informal and unsecured jobholders specially of women and agri-wage laborers in the value chain lost employment and incomes • Creation of income shock specially for poor, disadvantaged, agri-laborers and women headed HHs. 	<ul style="list-style-type: none"> • Realization of importance of agriculture reflected in plan and budget • Local production and distribution with fare and transparent procedure • Use of ICT and mobilization of youth for effective response

Pillars	Underlying causes/Barriers	Key Drivers
	<ul style="list-style-type: none"> • Market distortion and disruption and immediate impact in perishable products where majority of the producers and workers are women • Mobility of goods and services are restricted which hard-hit women producers and workers the most • Decline of demands in markets, hotels, restaurants by 50-60% and many lost jobs in the production and supply chain and 65% of fresh vegetable collectors terminated their business • Lockdown and prohibitory order impacted on free flow of fresh produces, create shortage in the market price hike and pressure on poor, disadvantaged and women headed HHs the most • Women have pressure in kitchen management from both mental and physical impacts • Weak enforcement of policies and laws to protect small holders, poor, women for safety nets • Non-consideration of agriculture as a vulnerable sector and the actors engaged as vulnerable groups and are exposed to shocks • Weak capacity of the state to respond to pandemics e.g., inputs supplies, technical support, market facilitation, food relief 	<ul style="list-style-type: none"> • Medium to large industries focus on agri-business for job creation and income for poor and women in specific • Crisis to Creativity: divert to green economy for job creation with sustained income for livelihoods • Retention of returnees by promoting agro-based enterprises • Emphasize in generating employment and income earning • Innovations in supply chain management and markets that create employment opportunities for those informal workers mainly of women and poor
Inequality in access to economic opportunities, resources, gender	<ul style="list-style-type: none"> • Access to and control over land and other resources • Inequalities exist across the food chain • Restriction on mobility to women in specific caste/ethnicity/religion/geography • Poor infrastructure and other support e.g., childcare, safe transport for women and PWD • Discriminatory social norms, beliefs, and practices • Geographical inequality due to limited access and required infrastructures including ICT • Fragmented policies, no proper targeting to poor, women and youths • Less promotional schemes for targeting 	<ul style="list-style-type: none"> • Knowledge and networking (e.g., IKT) • Constitutional provisions (fundamental rights and directive principles) • Positive discriminations (e.g., quota) • Increasing interest of government to support targeted policies and programs in support of women, youth and poor • Public awareness and sensitivity to organize in

Pillars	Underlying causes/Barriers	Key Drivers
	<ul style="list-style-type: none"> No safety net schemes for women-led productions, SMEs, workers in the food chain 	<p>groups, cooperative for the support to each other during emergencies</p> <ul style="list-style-type: none"> Increasing awareness and organizing in groups, cooperatives, networks to abolish social discriminatory practices as a collective effort

In summary, the prioritized underlying barriers/drivers for achieving the stated proposition for Action Track 4 are of:

- Improper implementation of land use policy; land fragmentation denying access for women and small holders.
- Inadequate access of women and marginalized groups to control over productive resources including land, water, credit etc.
- Lack of supporting mechanism for small holders (e.g., land consolidation prefers organising and mobilizing relatively larger farmers).
- Least access to indigenous crops/seed and problem of food diversification, which is predominantly a domain of indigenous people, poor, disadvantaged and women.
- Least involvement of human resources (as agriculture sector is considered as low-grade work) where women, poor and disadvantaged groups are involved for their livelihoods.
- Improper management of water sources affecting agricultural productivity specially in the low stream areas, and small holders for e.g., people in downstream side of Chure range affected by floods and loss of productive lands, displacements.
- Poor or absence of enforcing mechanism for budget allocation and expenditure in agriculture sector supporting to youth, women, small holders.
- Discrimination in employment opportunities, wages including agriculture sector and food to wage workers (gender wise) as well as value chain.
- Minimal utilization of local crops' diversity and depend on processed foods and chances of malnutrition and under-nutrition.
- Inadequate market linkage for agricultural and livestock produces for better incomes from the farm.
- Inadequate cooperative responsive laws and policies, where maximum numbers of women and poor are associated with.

Key Propositions, Pathway, and Game Changing Solutions/Actions

Propositions: Developing inclusive and diverse food systems that contribute to the elimination of poverty and food and nutrition insecurity by creating jobs, raising incomes across food value chains; protecting and enhancing cultural and social capital; reducing risks for the poorest and increasing value distribution.

Pathway: Invest on R&D and innovation to diversify the food systems and develop entrepreneurship skills of small and commercial farmers including SMEs to raise their income from the food value chains and improve their livelihoods and address the problem of food insecurity leaving no one behind.

Game Changing Solutions/Actions

While devising the actions and or game changing solutions, it is very pertinent to consider gender relations and inclusivity for sustainability through enjoyment of equitable livelihoods options. Therefore, it is very important ...advancing for equitable livelihoods, some propositions as levers of change that are organized within the five components of sustainable livelihoods below:

In a nutshell, the prioritized actions for next three years that will have greatest impact under Action Track 4 are summarized as below:

- Implementation of land use policy that facilitates inclusive tenure rights and user rights for women, small holders and poor.
- Leadership of provincial and local government for collaboration with cooperatives in promoting agriculture-based production, enterprising, marketing and reaching marginalized groups for required inputs and services.
- Joint leadership of federal, provincial, and local governments for market linkage of agricultural and livestock products for both domestic and export markets.
- Capacity strengthening, and infrastructure development for agriculture sector in both pre and postproduction spheres including women and small holder responsive mechanization (in both pre and postproduction spheres) for employment creation and incomes for sustained livelihoods.
- Need of Crisis Responsive actions in agriculture sector to protect producers, agri-based SMEs, and business groups against any damages and or losses.
- Conservation, promotion, and registration of indigenous seeds to diversify food and nutrition as well promotion for markets including international trade.
- Provision of farmer's ID and categorized incentives for small holders and commercial farmers.
- Provision of production loyalty for organic farming system with promotion of domestic market friendly policy.
- Need of robust monitoring and evaluation system of program, grant and any other support provided to ensure that women, youth, and small holders are benefitted out of it.
- Manage equitable relief system in agriculture sector in a transparent, inclusive, and efficient manner.
- Raise awareness on local and nutritious foods in both urban and rural areas that create demands for local foods.
- Diversify food system, innovate culinary arts, and promote processing industries for high value industrial crops that create employment and income for sustained livelihoods.
- Strengthen producers, vendors, market actors and consumers in the decision-making of rural food system transformation.
- Devise inter-connected programs linking with programs for income generation, safety net, health e.g., school feeding programs, tourism etc.
- Data based information management system for household mapping and design programs with appropriate institutional mechanism and budget allocations regarding equitable, inclusive and livelihoods options.

To ensure the above prioritized actions are being in place, following are the propositions made for in response of institutional, capacity, physical and social spheres.

Legal proposition: The Article 36 of the Constitution and legal provisions that ensure food security, right to food and food sovereignty is to ensure human rights, entitlements, and social justice without discrimination. Moreover, implementation of the Right to Food and Food Sovereignty Act, 2018 is an entry point to accelerate provisions for equitable food security and livelihoods. Likewise, the State policies and priorities e.g., “Happy Nepali, Prosperous Nepal” are some of the fertile grounds to exercise inclusive food system for equitable livelihoods. Management of land tenure and user rights for the producers whose livelihoods are relying on farming and create farm-based employment, incomes and livelihoods is crucial to attain equitable livelihoods. It is important to introduce farmer’s identity cards and make legal provisions for categorized services to farmers of different capacities for example subsistence, prospective commercial, commercial farmers, entrepreneurs, and business groups in the complete food system. This is in alignment with the proposals to transform smallholder farms from subsistence to profit by enhancing role of farmer’s organization specially of women farmers and combining food and nutrition security programs with other income generating programs with special targeting to women (Fan, et. Al, 2013). Likewise, it is important to develop fiscal policies that incentivize healthy food producers mainly of women and women-led enterprises (NPC and Global Panel on Agriculture and Food Systems for Nutrition, 2019). The legal provisions to ensure promotion of living incomes, fair wages, and decent work conditions in food systems. Likewise, there is a need of targeted policy provisions to promote nutrition to infant, middle childhood, adolescent, maternal nutrition, food-based dietary guidelines and enhancing balanced food baskets. The severity of impacts confirms the urgency to devise post-pandemic response policy for inclusive agriculture development and food security, ensure stimulus package for small holder, youth and women farmers, implementation of social-safety net programs that supports families with senior citizen, people with disabilities, children only families, families with chronic illness, women-headed households etc.

Institutional proposition: Promote Coordination, Collaboration and Cooperation among the three tiers of the governments in execution of Constitutional provisions through appropriate and inclusive institutional arrangements. In this context, it is required to implement of both the concurrent and exclusive rights stated in schedules 5 to 9 in assuring equitable livelihoods options through responsive institutions as per the need and priorities of marginalized people.

In this process, the three tiers of government have specified roles (exclusive rights and concurrent rights as specific in the schedules 5-9) as provisioned by the Constitution of Nepal. The federal government is mainly to devise umbrella policy to harmonise different policies including safety net measures and proper monitoring for standardisation, quality assurance and support in facilitating process of policy localisation and to ensure human resource placed at local levels. Likewise, federal, provincial and local governments to collaborate in facilitation of farmer identification/categorization and its implementation specially for targeting of services. Similarly, provincial and local government to focus on customizing policies to the specific requirements of geographical variations, cultural adoptability and needs and priorities of women and disadvantaged groups, SMEs in promotion of inclusive and diverse food systems. Provincial and local government to promote agricultural/land zoning and commodity prioritization. Provincial and local governments have main roles to facilitate

collaboration with Universities and academia network to engage youth/student for research actions; and local governments to manage basic agriculture and food related inputs supplies, output-based insurance, subsidies, seed banks, establish agricultural database.

In achieving this objective, it is important to create and strengthen inclusive institutional mechanisms for multi-stakeholder partnership through mobilization of cooperatives, private sectors and development partners.

Capacity proposition: It is important to develop and strengthen capacity of the provincial and local governments institutions, private sector actors, and cooperatives. Further, it is important to empower marginalized people to claim their constitutional and legal rights and entitlements for food security and equitable livelihood options. For example, engage private sectors in diversification of foods that also promotes investment and technology transfers to enhance capacity of all the actors in the food chain. It is also important to minimize the growing inequalities among the trading countries created by the protected agriculture in the developed countries through creating competitive market niche market for agri-products, strengthening and promoting use of ICTs, optimize special and differential treatments given by the trading arrangements such as World Trade Organization (WTO). Support to youths to engage in profitable agriculture that can enhance niche-based competitive local produces for both the domestic and export markets with better use of information and knowledge generated through research, studies and innovations. For this, youth, women and smallholders in specific require medium term response for entrepreneurial skills and technological transfer throughout the market supply chain. In doing this, it is vital to enhance role of farmer's organizations particularly for women farmers. It is equally important to collaborate with academic institutions and training institutes for the awareness about safe food habits, nutritional analysis and promotion of local seeds/crops/produces, and product transformation. Moreover, there is a need of targeted interventions to support poor, vulnerable, women and youth specially in the remote areas to mobilize them as levers of change. In addition, there is:

Physical proposition: It is a pre-condition ensure equitable access to land and other productive resources to the marginalized people. Enhancing their production and productivity require access to physical infrastructure such as roads, irrigation, storage, proceeding plants, transportation and marketplace. Moreover, it is essential to ensure their housing as per the constitutional provision that assures their safe stay as well as develop confidence for seeking employment opportunities. There is a high potential promote public private partnership to mobilize financial resources, transfer of technologies, transportations, research-based innovations specially in the post-production spheres, market and consumer's demand-based planning for production and post-production related infrastructures including laboratory services.

Social proposition: It is important to recognize that gender inequalities across the food system is one of the major hindering factors to deny access to nutritious food specially for girls and women. Therefore, it is important to strengthen targeted interventions that promotes cultural and nutritious foods in accordance with their cultural and geographical preferences. Further, urgent actions needed to change social discriminatory norms and practices that undermines local and nutritional food system through broader social awareness and legal actions. Likewise, it is essential to adapt gender-responsive solutions throughout the value chain. Similarly, provision of ensuring safety net is utmost

essential for transparent and inclusive relief and recovery programs. Finally, organizing, mobilizing, and organizing them into different social groups and networks to strengthen their collective capacity and voice to advance equitable livelihoods. In this juncture, it is equally important to devise province and or ecological zone-specific response mechanisms to address the locality based social and or cultural constraints. Along with this, it is equally important to ally with social mobilization programs to help women coming out of home and participate in policy formulation and implementation processes, participate and influence in the decision making of agriculture, employment, income, crisis-response and food systems related platforms and mechanisms.

Assessing the success of Action:

- Establish Information Technology based data management to assess and monitor number of vulnerable households, subsidies provided to different actors in the value chain and relief distributions transparently and equitably.
- Ensure workplace safety and equal pay for equal work for informal workers, agricultural wage workers and workers in the food chain and other industrial and construction sectors.
- Establish the system that considers natural resource management specially of land, water management and natural disaster to monitor and respond to minimize risks specially for poor and marginalized.
- Systematize program supervision mechanisms at the local government level to create ownership and accountability towards their role in responding inclusivity in the whole food system.
- Establish monitoring system for local and climate smart seed development of comparative advantages and culturally sensitive and protect small holders through climate risk-based agriculture system.
- Right to information to small holders, women, and vulnerable groups to be provided for their access to program related supports.
- Ensure equitable and diversified livelihoods options facilitated through multi-stakeholder engagement.
- Land use plan that ensures agricultural land protection and access of women, poor and disadvantaged for productive gains, use it as collateral for finance, security to leave family behind and go around for other seasonal employment and incomes.
- Mainstream agriculture biodiversity, functional community seed banks and promote local crops and organic products are being promoted in markets.
- Livestock-based food diversity ensured specially in high altitudes where indigenous communities, people in remote geographies and women can benefit for nutrition, food, and incomes.
- Institutional development that has competence to respond needs and demands of diverse communities, consumers, market needs such as agri-inputs and services supply mechanisms for access to all.
- Set minimum support price for staple foods that ensures easy availability for the economically hard-hit communities, women headed HHs, displaced and destitute families.
- Categorization of farmers and issuance of farmer's ID and define target indicators.
- Regulated market as per the demands.
- Decreased child mortality rates and access to healthy and safe foods and diets for children throughout the supply chains e.g., Food fortification, complimentary foods.
- Accountability framework to measure and monitor indicators for Right to food for all.

- Farmer's upliftment policy in place.
- Improved feeding practices for infants and children supported by social behavior change through education, counselling etc.
- Local level agriculture strategy in place that are women, poor and smallholder responsive.
- Organize farmers networks get supported and mobilized specially of women and youth led, and or mixed ones.
- Accessibility and support mechanisms to ensure equitable options for livelihoods to all.
- The indicators to include health and nutrition such as anaemic situation of women, under weight of mother and child, iron deficiency, obesity, hunger index and sustainable development goals related targets and achievements.
- Food security council at the provincial level and terms of references defined as per the provision of right to food and food sovereignty act.
- A multi-stakeholder platform for coordination and cooperation among public and private actors as well as joint monitoring of the policies and program implementations.
- Quality monitoring of food as well as amendment of policies and programs based on field level assessments and studies.
- Feedback collected using information technologies as well as public audits.
- Monitoring based on results for both the government and non-government sectors.
- Gender equality and social inclusion will remain as cross cutting theme throughout the defined processes.
- Establish relief fund based on pre-assessment of needs for targeting to informal sector workers and vulnerable groups.
- Pre-planning for production and relief package.
- Establish grievance dealing and response mechanisms for inequalities in accessing food for all.

Roles and Responsibilities of governments and other stakeholders:

Federal Government:

- Federal government to devise policy frameworks that promotes rights-based equality approach in ensuring food for all equitably;
- Federal government to facilitate long-term investment for structural transformation in food system. It is also important to enhance innovation and technologies to diversify food system with adaptation of policies and institutions for equitable food security and livelihoods;
- Federal government to support in developing scientific pricing mechanisms for food crops and strengthen regulatory systems to ensure accessibility and affordability for all specially of vulnerable groups;
- Federal government to make food estimates and support provincial and local governments in making forecasts and food supply plan specially during crisis management, so the vulnerable groups specially of informal workers, women, displaced communities are more secured;
- Federal government to play role of defining policies that enhance equitable access to production inputs, facilitate investments specially in research and promotion of technologies that are appropriate to women farmers, small holders and in post-production chains that can create opportunity for employment and incomes for women, youth and local communities;

- Federal government to facilitate for cooperation, collaboration and coordination among three tiers of governments and multi-stakeholders for policy harmonization on ensuring equitable access to food and livelihoods options;
- Federal government to focus on policies, mobilization of development partners, invest in research and innovation, coordinate for financing as well as stabilize price for staple food items as well promote exports through trade facilitation, fair and balanced supply system and technical assistance, execution of big projects and manage import and exports based on needs and potentials;
- Federal government is responsible for defining umbrella policy, work plans as well as invest in capacity building of provincial and local level human resources as well as coordination with the development partners for collaboration and coordination of efforts to advance equitable livelihood options as per the local needs, demands and priorities; and
- Federal government to devise policies and make necessary amendments to make it demand responsive of different actors in the food chain.

Provincial Governments:

- Provincial governments to prepare comprehensive food supply plan, establish food stock management system as well as food banks specially for the crisis period that ensure poor and vulnerable people's access to adequate food for all;
- Provincial government to facilitate collaboration among the municipalities, inter-provincial and with federal government for financing and program design for inter-municipality coordination, data management, support agri-based enterprising and marketing with proper management of human resource through public private partnership in creating equitable food supply system that creates employment and income in the food chain;
- Provincial government to support in establishment of food-based industries, diversify and commercialize local food products, promote processing related technological developments and create opportunities for employment, income and better livelihoods of women, youth and local communities;
- Provincial government to develop indicator and institutional mechanisms to monitor state of food security with equality specific indicators on right to food for all with specific emphasis on children, women, poor, vulnerable groups and livelihoods options equitably;
- Provincial food security council as envisioned by the right to food and food sovereignty act to get established with inclusive representation for the voice of rights holders;
- Provincial government to invest in technology development, capacity building, market facilitations, enterprise development, quality monitoring, establishment of resource centers and execution of medium enterprises to ensure no one leaving behind in access to adequate food; and
- Provincial governments to develop provincial strategy for inclusive livelihoods opportunities for all in the food chain.

Local Governments:

- Local governments to establish food bank at local levels that promotes local seeds, foods that are culturally acceptable, nutritious and easily accessible to all;

- Local governments to establish system of identifying the disadvantaged and vulnerable groups in their constituencies, support small farmers for their product sell, and improve monitoring of food quality in the food chain;
- Local governments to create awareness against the social/religious discriminatory practices that inhibits girls and women in accessing quality and nutritious foods specially during their menstruation cycle, pregnancy and lactating periods;
- Local governments to devise local targeted policies that promotes their niche-based farming, production and productivity enhancement, and promote partnership with private sectors, farmers and entrepreneurs;
- Local governments to implement programs, monitoring, reporting with proper data management on food security status, equitable access, diversified livelihoods options and relief supports when needed;
- Local governments to establish system of participatory problem identification in the local food system, programming and targeting accordingly;
- Local government to mobilize public private partnership as well as cooperatives to support and reach out to vulnerable groups;
- Local government to establish inclusive food security committee as envisioned by the right to food and food sovereignty act;
- Local government to depute technical human resources, allocate and facilitate investment in agriculture and food chain, promote nutritious local landraces, crops, foods, manage fair price shops, define geography specific policies, nutrition programs for landless and poor;
- Local governments to emphasize in identification of local landraces, their selection and promotion of locality specific, culturally acceptable and nutritionally rich values with which the local, indigenous and women retained knowledge and skills are associated with;
- Local governments to introduce demonstration programs on home gardens at homestead and school level to children to impart knowledge on diversities, foods, nutrition, and health as well as other associated benefits; and
- Local government to define local strategy, guidelines that are as per the need, demand and potential of local demography, geography, and cultural needs.

Concurrent rights related roles:

- Inclusion of gender dimension in plans and policies at three tiers of policies, institutional mechanisms and programs;
- Requirement of sustainable policies and plans at all three tiers that serves to all equitably;
- Prioritize agriculture in policy and plans of provincial govt to ensure equitable access to means of production, employment opportunities and fair distribution of incentives to the vulnerable groups;
- Protection of Chure area for sustainable management of cultivated lands and geographically inclusive cropping patterns and food system as well as protection of people in the downstream sides of vulnerability;
- Advocate for sufficient and conditional budget allocation for agriculture, livestock, food and nutrition security related programs at local level;
- Development of programs for youth to change their attitudes towards agriculture specially at the local and provincial levels;

- Agriculture related skill development programs to women administrative support to local govt to improve coordination, deputation to local level by province to act as a focal point;
- Maintaining database from local level and mapping of vulnerable area and households;
- Facilitate to institute inclusive food security council and committee as envisioned by the right to food and food sovereignty act;
- All three tiers to implementation of existing policies with proper role clarities avoiding duplication of efforts from all tiers of government requires proper coordination to understand, define and prioritize government policies, plans and programs to ensure equitable access to production resources, create employment opportunities in both agriculture and non-agriculture sector, provision of incentives as per the need of categorized group of farmers, as well as target for relief to vulnerable groups;
- Provincial and local government to invest in capacity building, local landraces development and promotion, awareness raising about safe food for all, prepare land use policy, program and execute them, create environment for enterprise and employments; and
- All governments in three tiers to identify vulnerable groups, establish data, targeted programs for vulnerable, transparent information to all, link with social safety net programs system for relief management, manage food stocks/storage at different levels.

Other actors:

- All actors should engage in managing relief programs in times of emergencies and disasters to ensure all have equitable access to food irrespective of gender, age, religion, geography etc. as well as post-disaster support programs such as land reclamation process and land allocations for the farming communities specially of women headed households and small-holders, revival of food markets and distribution systems;
- Academic institutions to integrate agriculture biodiversity based and nature-based farming to promote safe and healthy foods accessible for all in different geographical locations and adaptive to cultural preferences in their course curriculum and research programs that are age, gender, health, market responsive;
- NGOs/CBOs to play role in social mobilization, capacity building, awareness raising and evidence-based advocacy about local, nutritious, diversified food system development as well as eliminate social-discriminatory practices;
- Private sector to invest in value chain development of agri-based and safe food enterprising, marketing and job creation that are suitable for all including youths, women; and
- Dedicated financial institutions to be identified to ensure financing to targeted groups and commodities such as women, youth, dalit led enterprises, cooperative farming, group marketing etc. at local levels.

Action Track 5: Build Resilience To Vulnerabilities, Shocks & Stress

Context

Our current food system is under pressure from economic shocks, climate crisis, conflict, COVID-19 pandemics, environmental degradation, and natural disasters including food price hikes and disease-pest's outbreaks. These shocks, stress and disaster can be devastating for poor and vulnerable people who have limited resources and options. Such shocks can intensify the risk of food and nutrition

insecurity and increase vulnerability of the poor and marginalized people. The major typology of natural and human induced disaster, hazards, shocks, and stress are natural disasters (earthquake, storms, flood, drought, forest fires etc.), climate change effect (extreme rainfalls, drought, cold wave, GHG emission, disease, and pest epidemics etc.), pandemics (COVID-19, Bird flu, SARS, Ebola etc.), famine, economic crisis (financial crisis), conflict (conflict on resources, armed struggle, war, political conflict etc.) as indicated Table 5.

Table 5: Typology of natural and human induced hazards, shocks and stress affecting food system

Natural disasters	Climate change effect	Pandemics	Famine	Economic crisis	Conflict
<ul style="list-style-type: none"> • Earthquake • Storms • Flooding • Drought • Forest fires 	<ul style="list-style-type: none"> • Extreme rainfalls • Drought • Cold wave • GHG emission • Disease and pest epidemics in agriculture 	<ul style="list-style-type: none"> • COVID-19, Bird flu etc. destroying supply chains 	<ul style="list-style-type: none"> • Chronic food insecurity and malnutrition 	<ul style="list-style-type: none"> • Financial crisis causing food crisis 	<ul style="list-style-type: none"> • Conflict on resources, armed struggles, war etc.

Recently, climate, COVID-19 and conflict and natural disasters have become increasingly significant as main drivers of food crises. Climate extremes are the key factor in explaining food insecurity for over 34 million people across the globe in 2020 (GRFC, 2021). Climate change is likely to lead to increasing food cost impacting consumers globally through higher prices and reduced purchasing power, with low-income consumers particularly at risk from higher food prices. The socioeconomic impact of COVID-19 also has contributed to rising unemployment, inflation, and poverty across the globe in 2020-21, curtailing poor households’ access to food in terms of both adequacy and quality. Similarly, natural hazards have devastating impact in agriculture and food system with 22 percent of the total damage and losses caused by natural hazards in developing countries (FAO, 2015a). Of all-natural hazards, floods, droughts and tropical storms affect the agriculture sector most showing the severe impact of climate-related disasters. More than 80 percent of the damage and losses caused by drought is to agriculture covering both livestock and crop production.

Building resilience means helping individuals, households, communities, and countries prepare for, mitigate, cope with, and recover from shocks-so that they can not only bounce back but even become better off. In this context, this action track 5 aims to ensure that all people within a food system are empowered to prepare for, withstand, and recover from instability and participate in a food system that, despite shocks and stressors, delivers food security, nutrition, and equitable livelihoods for all. In short, it focuses that food system is inclusive, equitable and **supports to natural environment; and communities, which are resilient** to all shocks and vulnerabilities including conflict and pandemics.

The action Track has 5 action area that covers building resilience to vulnerabilities, shocks, and stress, which are outlined below.

Action Area 5.1: Food Systems Resilience

Action Area 5.2 Universal Food Access to Build Resilience

Action Area 5.3 Climate resilient pathways to food system transformation

A short description of each action area is outlined below.

Action Area 5.1: Food Systems Resilience

This action area aims to make **food systems functional, sustainable and resilient during conflict, climate crisis, economic shocks, natural disasters and pandemics (COVID-19)**. It focuses on Integrative and Nexus approaches and Anticipatory and Multi-Risk Reduction and Management actions to build food systems resilience to shocks and stresses related to conflict, fragility, environmental extremes, natural adverse events, economic shocks, pandemics such as COVID- 19 and plagues. Specific areas of work include: i) Nexus Humanitarian Development & Peace; ii) the Water-Food-Energy Nexus, and iii) Anticipatory, Multi-Risk Reduction and Management Actions.

Action Area 5.2 Universal Food Access to Build Resilience

This action area aims to enhance universal food access to all by ensuring participation of the people in food systems to deliver food security, nutrition, and equitable livelihoods through building resilience to vulnerability, shocks and stress. Enacting food as a public good as the game-changing narrative shift by guaranteeing that food reaches everyone, either by market mechanisms, public provision, or civic collective actions for food. It considers that food is not only a commodity but also a public good and as a human right or as absolute need: Its components are a) Nutrition-sensitive Safety Nets, b) Employment-Generation Schemes, c) School Feeding, d) Shock-responsive Social Protection, e) Targeted public procurement for food, f) Food reserves and storage capacity, g) Food banks as public network.

Action Area 5.3 Climate resilient pathways to food system transformation

This Area focus on the integration of policy and actions to support Climate Resilient Development Pathways for food systems transformation and to meet the SDGs at national, local, and global levels. Climate Resilient Development Pathways are development trajectories based on equity and justice, which combine climate adaptation, mitigation, and climate resilient development with the goal of sustainable development. Specific actions aim to build resilience of the most vulnerable people and communities by supporting the development of National Policy and Action Plans for Food Systems Transformation and Resilience by 2030.

[Analysis of Nepalese Food System](#)

Problems and Issues

The current food system in Nepal is negatively impacted very much from natural disasters, climate change effect, pandemics (e.g., COVID-19) and economic shocks and food insecurity crisis from combination of natural and human induced disaster, shocks, and stress. Disasters disrupt food supply chains, reduce not only quantity of food but also quality and safety of the food to be supplied including disruption in input supply, reduce production, harvesting and processing system as well as triggering other disasters such as disease /pest epidemics, conflict, famine and landslides, soil erosions etc.The most important crisis faced by the country presently are mainly natural disasters, climate change impact and COVID-19 pandemics and their consequences in terms of food insecurity, loss of livelihoods and production sustainability. They are briefly outlined in text:

Natural disasters: Natural disasters include nature induced/caused events such as earthquake, storms, flooding, drought, forest fires. They disrupt food supply chains, reduce not only quantity of food but also quality and safety of the food to be supplied. According to MoPE (2017), natural disasters both climate and human induced cause significant losses, where 49 districts are prone to floods and/or landslides, 23 districts to wildfires, and 1 district to windstorms. The 2015 earthquake of Nepal which was a major natural disaster occurred in Nepal caused severe impact on food insecurity with 3.5 million people in the need of food assistance (FAO, 2015b). The total value of direct and indirect impact of the earthquake to Nepalese economy was close of USD 7 billion, equivalent to one-third of country's GDP in addition to its long-term negative secondary and tertiary effects of triggering other disasters such as landslides, soil erosion and depletion of water sources (NPC, 2015) and loss of agrobiodiversity (Gauchan et al. 2015). Droughts and floods are two major disasters affecting every year particularly food insecurity of poor and vulnerable with drought effects in hills and mountainous districts of Karnali and Sudur Paschim provinces and flooding effects in lowland Terai. Time series study (1987-2017) of climatic parameters has revealed frequent occurrences of drought events during summer maize and winter wheat crop season that occurred during the sensitive

Climate change effect: The impact of climate change includes extreme rainfalls, drought, cold wave, GHG emission, disease and pest epidemics in agriculture, which affect our food systems. They are caused by both natural process and human induced activities. Evidence shows that about 99% of the people perceived increased drought in the last 25 years, 98% observed increased disease and insects, 85% observed delayed rains and 78 % observed increased landslides (CBS, 2016). Climate induced disasters have significant impact to national economic and social development of the country with direct cost of these events equivalent to 1.5– 2% of current GDP/year at 2013 prices, and as much as 5% in extreme years. The economic costs of drought events in 2006 and 2009 incurred estimated direct economic costs from lost agricultural output equivalent to 1.9% and 0.4% of GDP, respectively. Nepal is one of the most climate vulnerable country as per the report of Global Climate Risk Index, which ranked Nepal as the 9th most climate vulnerable country in 2018 based on assessment of climate risk from 1999-2018 (German watch, 2020). Similarly, climate change has increased incidence of insect-pest and disease incidence.

Pandemics (COVID-19, Bird flu etc.). Pandemic like COVID-19 in the last one hand half years has negatively impacted food system in Nepal by destroying supply chains and hindering timely planting and harvesting of agricultural products including loss of employment, increased incidence and prevalence of food insecurity, malnutrition, and poverty. COVID-19 has also caused severe impact in food security of the people in Nepal with more than 30 percent of rural households spending less on food even six months after an initial lockdown (IFPRI, 2021). Dietary quality and diversity have been affected by both reduced incomes and reduced availability of nutritious perishable products such as fruits, vegetables, and animal-sourced foods. COVID-19 affected more to wage labourers, indigenous people, and women from marginalized groups and regions already vulnerable in food security and malnutrition as they lost both external support and the coping mechanisms (Adhikari et al., 2021).

Based on the current contexts of the problems, the assessment demands a comprehensive approach that integrates responses to climate, biodiversity loss, conflict, pandemics, economic crises, food insecurity, malnutrition and considering poverty, inequalities and poor land use and distribution as structural root causes of increased hunger.

Barriers /Drivers of Vulnerability, Shocks and Stresses

Resilience building of individuals, households, communities, institutions, systems and societies is critical to prevent, resist, absorb, adapt, respond and recover positively, efficiently and effectively when faced with a wide range of risks, while maintaining an acceptable level of functioning without compromising long-term prospects for sustainable development, peace and security, human rights and well-being for all". The resilience of food systems needs to be strengthened in such a way that the economic, social, environmental and policy and governance foundations to produce sufficient nutritious food and maintain healthy ecosystems for current and future generations are not compromised. There are broadly 4 drivers to build resilience to vulnerabilities, shocks, and stress (Figure 13). These include (i) social drivers (ii) economic drivers (iii) environmental drivers and (iv) policy and governance drivers. These are briefly outlined below.

1. Social Drivers

- Male migration resulting drudgery and vulnerability to women
- Conflict in natural resources (land, forest, water) and political conflict
- Social/cultural taboos, norms, practices on food consumption and livelihood

2. Economic drivers

- Economic crisis: loss employment and livelihoods,
- Food insecurity and malnutrition from Pandemics (Covid-19)
- food price spike,
- Unplanned Infrastructure development causing landslides, erosion and vulnerability of poor

3. Environmental Drivers

- Natural disasters flooding, landslides, soil erosion
- Adverse effect of climate change
- Forest fires destroying forest foods, livelihood from forest products
- Depletion of ground water resource

Drivers of Building Resilience to Vulnerabilities, Shocks and Stress

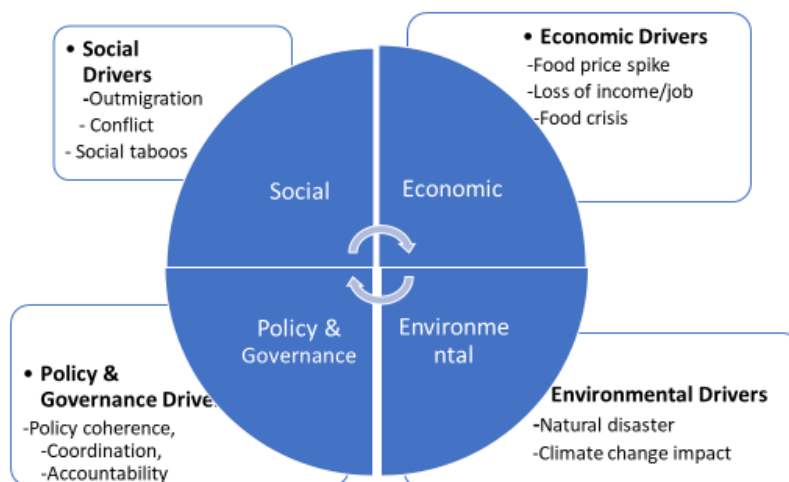


Figure 13. Drivers of building resilience to vulnerabilities, shocks, and stress

4. Policy and Governance Drivers

- Ineffective enforcement of policies and legislation (e.g. land, environment, forest, health, agricultural policies)
- Unplanned /unscientific/lack of evidence-based decision making for use of natural resources (short term-immediate benefits purpose; pressure-based decisions)
- Lack of policy coherence among sectoral policies (e.g., food, health, environment, agriculture, education) and among 3 tiers of government
- Lack of accountability and rent seeking behaviours of public and private food system actors
- Poor horizontal and vertical coordination among 3 tiers of government and relevant stakeholders

Key Propositions, Pathway, and Game Changing Solutions/Actions

Proposition: Developing inclusive and equitable food systems to ensure that all people within a food system are empowered to prepare for, withstand, and recover from instability and participate in a food system that, despite shocks and stressors, delivers food security, nutrition, and equitable livelihoods for all.

Pathway: Ensure longer-term investments on developing the resilient food system and community to withstand shock and stresses for sustainable and equitable livelihoods for all.

Game Changing Solutions/Actions

Food systems have the potential to nurture human health and support environmental sustainability by building resilience of households, communities and societies to vulnerability, shocks, and stress. Rebuilding food systems in the wake of disasters (drought, floods etc.), climate and economic crisis, pandemics (COVID-19) presents a particular challenge to Nepal, where resources are limited, and a large segment of population are affected every year. But these disasters, shocks and stress also presents an opportunity to the country not just to restore, but also to fundamentally transform current food systems by building resilience of the people to vulnerability, shocks, and stress. There is a need to ensure that food systems are regenerative and circular and thus more resilient to future shocks for sustainable, inclusive, and resilient food system transformation. Resilience building is essential at the individual, community, government, and national food system level to generate sustainable food system for the benefits of people and planet. Some of the potential suggested actions for improvement in food system by building resilience of the households and communities to vulnerabilities, shocks and stress are outlined below.

- Immediate relief programs on seed, foods and livelihood asset generation and improvement.
- Food and nutrition security recovery programs through improved production, post-harvest and marketing climate smart technologies and practices.
- Employment generation to poor and vulnerable (e.g., food for work program) by linking Prime Minister (PM)/ Chief Minister (CM) employment programs to Food Systems.
- Enforcement of land use policy and legislation for unscientific land use changes (conversion to non-agricultural purpose), fragmentation, land abandonment.
- Social safety net /social protection programs to vulnerable households (e.g., health insurance, agricultural insurance, employment of unemployed etc.).

- Evidence-based decision-making linking to food security monitoring system to early warnings and disaster risk and response management (preparedness, response, and recovery mechanism in place).
- Food security monitoring system (NEKSAP) in place for vulnerability and mapping of affected people.
- Food storage/reserves, food banks and stocking of food including supplementary/therapeutic food for emergency, strengthen food distribution system.
- Establishment and strengthening community seed banks and cooperatives for locally adapted seeds, input supply and product marketing.
- Regenerative smallholder family farming for healthy food production and climate adaptation.
- Digital technologies for sharing climate, market, and price information in reducing vulnerability and building resilience.
- Subsidies and technical support on inputs, marketing, and storage of nutritious foods to poor and vulnerable households.
- Collateral free subsidized micro-credits to poor and vulnerable households in food production, marketing, and livelihood resilience building.
- Agricultural insurance programs for nutritious and healthy food production and risk reduction
- Minimum support price and public procurement program for farmers products.
- Capacity building and empowerment of local communities and women to absorb shocks and stress and reduce vulnerability.
- Climate-resilient technologies, practices, and agro-advisory services to promote local production for promoting local consumption.
- Agro-advisory/Agromet services with climate forecasting, profiling, and monitoring.
- Resilient seed system for resilient food system development.
- Access and entitlement to land and other natural resources to women and vulnerable communities.
- Improved access of vulnerable HHs to national and international markets.
- Increasing R& D investments to develop and disseminate resilience technologies.
- Mainstreaming resilience into sectoral programming; develop risk informed program, building resilience for food system.
- Vulnerability card to the vulnerable people for providing relief and recovery assistance.
- Food security and climate change adaptation to be integrated into development planning process of the local government, through LAPA process.
- Public Private Partnerships (PPP) offer an important opportunity to leverage resources from the private sector to build resilience of the communities.

Assessing the Success of Actions:

The focus of the implementation of above suggested actions should be outcome oriented that build the resilience of the households, communities and societies to vulnerability, shocks, and stresses. There is a need of improvement in political will and commitment to build the resilience for sustainable food system transformation. The important identified options for assessing the actions being successful should include followings.

- Evidence of building resilience in national and subnational policies, programs and budget allocation and spending in timely manner.

- Result framework, food system indicators, and software-based information management system in place to monitor the progress in participatory way.
- Integration of climate and vulnerability monitoring provisions; and development of information centers and network at sub-national level.
- Integrated information system with early warning system and reporting system established for disasters and shocks (focusing on digital technologies).
- Joint multi-stakeholders (including private sectors, consumer groups) monitoring of resilience building programs including identification of vulnerable groups.
- Data and input collection from the grass root level regarding the effectiveness of the program.
- Food security monitoring system development and implementation periodically and jointly with multistakeholder.
- Annual and quarterly progress reports and feedbacks widely shared and used in planning.
- Development and distribution of identity and food cards for vulnerable /poor.
- Capacity development of local stakeholders including poor and vulnerable for use of budget, advanced planning and enhanced access to resilient technology, capital, and information.
- Increased investment in resilient technology development and resilience building of poor and vulnerable groups.
- Proper use of digital technologies (e.g., ICTs) in social media responsive in reporting as well as building resilience of poor and vulnerable people.

Collaboration and Roles and responsibilities of Governments and other Food System Actors

Strengthened linkages and coordination among 3 tiers of government and private sectors is essential to build resilience of the vulnerable households, communities, and societies. The important suggested actions for Federal, Provincial and Local Governments and Private Sector are outlined below.

Federal Government:

- Formulation of umbrella policy and action plans in building resilience to vulnerability, shocks and stress and develop policy on identification and categorization of vulnerable groups
- Enforcement of land use policy and Act and develop land regulations to reduce conversion of agriculture land to non-agriculture and reduce land fragmentation
- Establishment of multisectoral disaster response unit, Early warning system, Emergency fund management, Policy alignment.
- Facilitate establishing a reliable Hydro-met services (satellite based) and coordinate to develop better preparedness plan with 3 tiers of government and private sectors.
- Priority should be given to agriculture and farmer centric weather forecasting based investment and establishment of weather forecasting system
- Develop national disaster risk reduction and disaster investment plans /disaster financing and coordinate with 3 tiers governments for programming and budgeting
- National capacity building of stakeholders in disaster risks reduction, adaptation and building resilience
- Coordination with national multi-stakeholders (private, NGOs, consumers group etc.) in raising awareness and building resilience of the households, communities, and societies

- Strengthening national Information management system focusing on weather forecasting models and methods development as well as price and market information system
- Formulating laws which allow diverse national and international agencies and other private actors working collectively with 3 tiers of govt in field of preparedness, risk reduction and distribution of relief package.
- Enhancing access to new technologies and organic markets at the international and national market
- Strengthen social protection system: Food bank, Food safety net etc.,
- Surveillance and rapid response-to tackle risks during disasters,
- Cross ministerial collaboration to ensure food security and food safety
- Food assistance program in collaboration with international agencies and private sectors
- Formulation and implementation of national pride projects on infrastructure (transport and storage),
- Cross ministerial collaboration to ensure food security and food safety,
- Public-private partnership to increase investment to improve food security and resilience,
- Food system and safety traceability system to be developed
- Coordination in hazard mapping and recovering plan should be collectively managed

Provincial Government:

- Coordination with Federal and Local Government in implementation of programs on resilience building and identification of vulnerable groups.
- Preparation of strategic action plans for targeting resilience building of vulnerable groups.
- Mobilization of technical manpower in rescue, recovery and resilience building during and after disasters and shocks.
- Management and communication of provincial level information such as weather forecasting and market information.
- Establishment of weather forecasting system and its improvement and promotion at provincial level.
- Formulation and implementation of climate smart, organic Act and directives at the province level.
- Development of institutional capacity, information system and capacity of farmers and stakeholders on resilience.
- Implementation of land use policy and act to control land conversion to non-agriculture and fragmentation.
- Farmers' friendly research based on local land and agroecological context.
- Extension of resilient, climate smart and nutrition sensitive programs and technologies.
- Develop and enhance access to provincial organic markets and native agricultural products.
- Cross sectoral /disciplinary collaboration provincial level to ensure food security and food safety.
- Creating awareness about the role of agrobiodiversity for healthy and nutritious foods and resilience.
- Traceability system development and monitoring of the food system products and inputs.
- Pre-disaster storage of foods and seeds and strengthening foods and seeds distribution system after disaster.

Local Government:

- Identification of households and groups based on risks and vulnerabilities and provision of vulnerability card to the vulnerable people.
- Collection, storage, and distribution of special nutritious foods to vulnerable people and to the Pregnant and Lactating Women (PLW) during and after disasters.
- Local Emergency Operation Center (LEOC)/District Emergency Centre (DEOC) to be linked to food system.
- Insurance desks related to agriculture should be established in every local governments.
- Development of institutional capacity, information system and capacity of farmers and stakeholders on resilience.
- Raise awareness on local production and consumption of nutritious foods.
- Local strategy and frontline response in disaster Strategy development.
- Data collection and database management at the local level on disasters, vulnerabilities, risks, and resilience.
- Mapping of natural disasters and other events at the local level.
- Provisioning of quality local services during and post disasters.
- Disaster risk assessment, use of new agriculture technologies, mechanization, community seed banks establishment, and ensure enhanced equitable access to them.
- Awareness program, joint monitoring, and public-private partnership in disaster risks reduction.

Private Sector:

- Market promotion and value chain development of local nutritious foods and business models.
- Operationalization of agricultural insurance programs in local crops and commodities in collaboration with provincial and local governments.
- Development of market structure, collection centers, cold storage facilities and marketing of agricultural products to support local value chains and agricultural business.
- Develop partnership with local, provincial, and federal government in organization of national, regional and local level food fairs and seed fairs to promote marketing of organic and ecological products and seeds.

Action Track 6: Right to Food and Food Sovereignty Act -a legal framework for sustainable food systems in Nepal**Context in Nepal**

Recognizing the facts that hunger and poverty were one of the root causes of Nepal's decade-long internal conflict in Nepal, the Interim Constitution for the first time had acknowledged the right to food sovereignty. The Constitution of Nepal (2015) not only retains the right to food sovereignty but also protects the right to food in a comprehensively way. Guarantees under Article 36 of the 2015 Constitution include: (1) Every citizen shall have the right to food; (2) Every citizen shall have the right to be protected from the state of being in danger of life from the scarcity of food; (3) Every citizen shall have the right to food sovereignty in accordance with law.

Nepal enacted the Right to Food and Food Sovereignty Act as a comprehensive piece of legislation to implement the constitutional guarantee of the right to food and food sovereignty including through ensuring good governance of food systems and transform them. The government has given a priority to ensure safe and nutritious food to all in a sustainable manner. The Act provides a comprehensive legal framework accommodating all ATs and provides as a legal framework for the resilient, equitable and sustainable food systems in Nepal. Some of the key positive aspects of the Act in the context of the ATs relate to the identification of food-insecure households (Section 5 and 6); distribution of food to priority households (Section 7); protection of farmers' rights (Section 12 to 19); requirement to create a food plan (Section 20); creation of a public food supply and distribution system (Section 25 to 30); criminalization of certain elements impairing access to minimum essential foods (Section 39) and creation of national and provincial food councils and local food committee (Section 32, 34 and 36).

However, the effective implementation of the Act remains a challenge. The Government of Nepal still in the process of creating a regulatory framework to implement many of the Act's provisions.

Underlying Drivers

- Inadequate efforts for effective implementation of the Right to Food and Food Sovereignty Act.
- Ineffective coordination between provincial and local levels.
- Weak policy coherence among three sparses of government under the federal set up.
- Inadequate dissemination of information and awareness about the law, implementation efforts.
- Federal, Provincial and Local Level Bylaws on Right to Food (RtF) act not yet developed.
- Lack of institutional set up such as National Food Council , provincial food council and local food coordination committee have not yet been established.
- Lack of clear roles and responsibilities and accountability mechanism among the stakeholders.
- Limited consultations with stakeholders, while formulating the Act; outcomes of the consultations were not widely shared.
- Inadequate monitoring and oversight of the implementation process.
- Governments, particularly at local levels lack technical capacity to prepare local laws and policies on right to food.
- Lack of institutional set up like technical food security committee are to implement RtF act at Municipality and Provincial levels

Key Propositions, Pathway, and Game Changing Solutions/Actions

Proposition: Referring to the overarching legal document developed based on the constitutional provision, Right to Food and Food Sovereignty Act (2018), is considered as a legal framework that governs actors of the food system and their activities with implications for ATs.

Hence, this Act and related policies are the key to strengthen food system governance and accountability and transform food system that is resilient, equitable and sustainable.

Pathway: Develop **coherent policies and strategies in line with the Right to Food and Food Sovereignty Act**, and prioritize **implementing the Act through the approval of Bylaws** and comprehensive **orientation to the stakeholders to ensure accountable food governance** at all federal structure for achieving resilient, equitable and sustainable food systems.

Game Changing Solutions/Actions

- Set up and strengthen institutional architecture at 3 spheres of government (based on Act, policy, strategies, etc).
- Develop Bylaws on Right to Food and Food Sovereignty Act and implement them for advancing food system and food governance.
- Orientation to people's representatives, farmers and other stakeholders about the law, policies and programs
- Coordination mechanism to bring together three spheres governments and regulate their activities towards strengthening governance and accountability.
- Formulation of necessary provincial Act and regulations with implications for ATs.
- Implement farmers' identification card.
- Ensuring policy /programme coherence in agriculture, food security and nutrition; build synergies.
- Adequate financing to the Province and Local levels based on their performance on the implementation of Act, and relevant policies.
- Implementation of 15th Plan, Periodic Plans, and localization of SDGs with priority.
- Invest on setting up a mechanism for systematic data collection, analysis, and management for strengthening the evidence-based policy making
- Promote research-based planning and implementation in the areas of the right to food and food sovereignty.

Assessing the success of Action:

- Legal and policy documents in place at three spheres of government.
- Institutional mechanisms in place and their functioning at three spheres of government
- Different reports illustrating the implementation status based on the indicators available such as Prime Minister's Office Human Right Indicators, FAO - Right to Food Indicators – SDG Goals , Human Development, Nutrition, Gini Coefficient, Hunger Index;
- Periodic and annual plans and annual budgets and programs.
- Increased visibility of the right to food and food sovereignty related issues in the media
- Number of programs at three spheres of government targeting the food insecurity
- Local, provincial, and federal database on the farmers and food insecure households
- Information mechanisms in place and their functioning at the local, provincial and federal level.

Collaboration/Partnership and Roles/responsibilities of Governments and Food System Actors:

Federal level:

- Formulation of bylaws necessary to implement the Act
- Establishment of the national food council
- Adoption of the national food plan
- Creation of the national food security information system.
- Awareness raising on the constitutional, legal and policy provisions.

- Adoption of the necessary guidelines and procedures.
- Creation of the compensation mechanism
- Appointment or designation of the food inspectors
- Creating conducive environment of the public distribution system
- Effective leadership of MoALD and active engagement of other line ministries such as MoICS, MoFAGA, to implement the Act.
- Effective oversight of the implementation by NHRIs and parliamentary committees.
- NPC's strategic guidance and monitoring of the implementation;
- Strengthening information system to promote evidence-based policy making and implementation.

Provincial level:

- Formulation of provincial Act and bylaws necessary to implement the Act
- Establishment of the provincial food council
- Adoption of the provincial food plan
- Creation of the provincial food security information system.
- Awareness raising on the federal and provincial legal and policy provisions.
- Adoption of the necessary guidelines and procedures.
- Creation of the monitoring mechanism
- Revitalization of the food storage, supply and distribution system.

Local level:

- Adoption of local food plan
- Creation of local food coordination committee
- Integration of the right to food perspective in the local laws
- Awareness building on the laws and policies
- Identification of the food insecure households.
- Identification of farmers
- Initiative for management and sustainable use of agricultural land.

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