



Food and Agriculture
Organization of the
United Nations



European Union



AGRICULTURAL RESEARCH
FOR DEVELOPMENT

FOOD SYSTEMS PROFILE - NEPAL

Catalysing the sustainable and inclusive
transformation of food systems



Nepal



FOOD SYSTEMS PROFILE - NEPAL

Catalysing the sustainable and inclusive
transformation of food systems

Published by
the Food and Agriculture Organization of the United Nations
the French Agricultural Research Centre for International Development
and
the European Union
Rome, Montpellier, Brussels 2022

Required citation:

FAO, European Union and CIRAD. 2022. *Food Systems Profile – Nepal*. Catalysing the sustainable and inclusive transformation of food systems. Rome, Brussels and Montpellier, France. <https://doi.org/10.4060/cb7653en>

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ISBN 978-92-5-135425-4

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FOOD SYSTEMS PROFILE NEPAL

Key messages

Nepal has made progress in **reducing food insecurity and in improving nutrition** in urban and rural areas. It still faces a challenge, however, to ensure the availability and affordability of healthy, locally produced food for a **growing and urbanizing population**. Although the right to food is enshrined in the Constitution, **food insecurity still affects more than half of Nepal's people**, particularly the quarter of the population. Despite government efforts, health problems related to **undernutrition and micronutrient deficiencies remain**, with more than a quarter of children underweight, more than a third affected by stunting, and anaemia widespread among women and children under five years old. Even as Nepal confronts these health issues, it faces **rising obesity and overweight numbers** in urban areas, with **aggressive marketing and supply of calorie-dense, ultra-processed convenience foods**.

Agriculture is the main source of livelihoods for nearly two-thirds of Nepal's people and contributes about 27 percent of its Gross Domestic Product (GDP). But **domestic production falls short** of the population's dietary demands and food imports have increased, particularly from neighbouring India. The **low productivity** of small plots, **inadequate infrastructure and access to markets** mean farmers' returns are small. **Large-scale migration**, particularly by young men from rural areas seeking better prospects in urban areas or in other countries, has in turn created a **shortage of agricultural labour**, further adversely affecting agricultural yields. This shift has also **added to workloads for rural women**, who take on additional labour, but for lower returns.

Nepalese agriculture is highly dependent on natural resources, with low levels of irrigation. **Climate parameters are becoming unfavourable** to agricultural production, as **average temperatures rise and droughts become more frequent**. Precipitation is becoming erratic, with **increasing floods and landslides**. **Loss of soil fertility** further undermines food production and there is a trend to higher doses of pesticides and fertilizers to increase production of cash crops and commercially grown vegetables, even though use of **agro-chemicals is generally low**. Inappropriate and over-use of agro-chemicals have resulted in **residues in food products**, as well as **downstream water pollution**.

Substantial development imbalances between rural and urban areas limit the outlook for people in the countryside. More equitable efforts to **enhance infrastructure and services in rural areas**, such as schools, health facilities, roads and markets, would contribute to increasing job opportunities away from the urban concentrations, easing rural to urban migration and associated territorial fragmentation, as well as reducing women's drudgery. Targeted approaches to improving productivity and livelihoods, including efforts to keep land cultivated, could in turn help to **increase production of healthy foods, reduce food imports and food insecurity**.

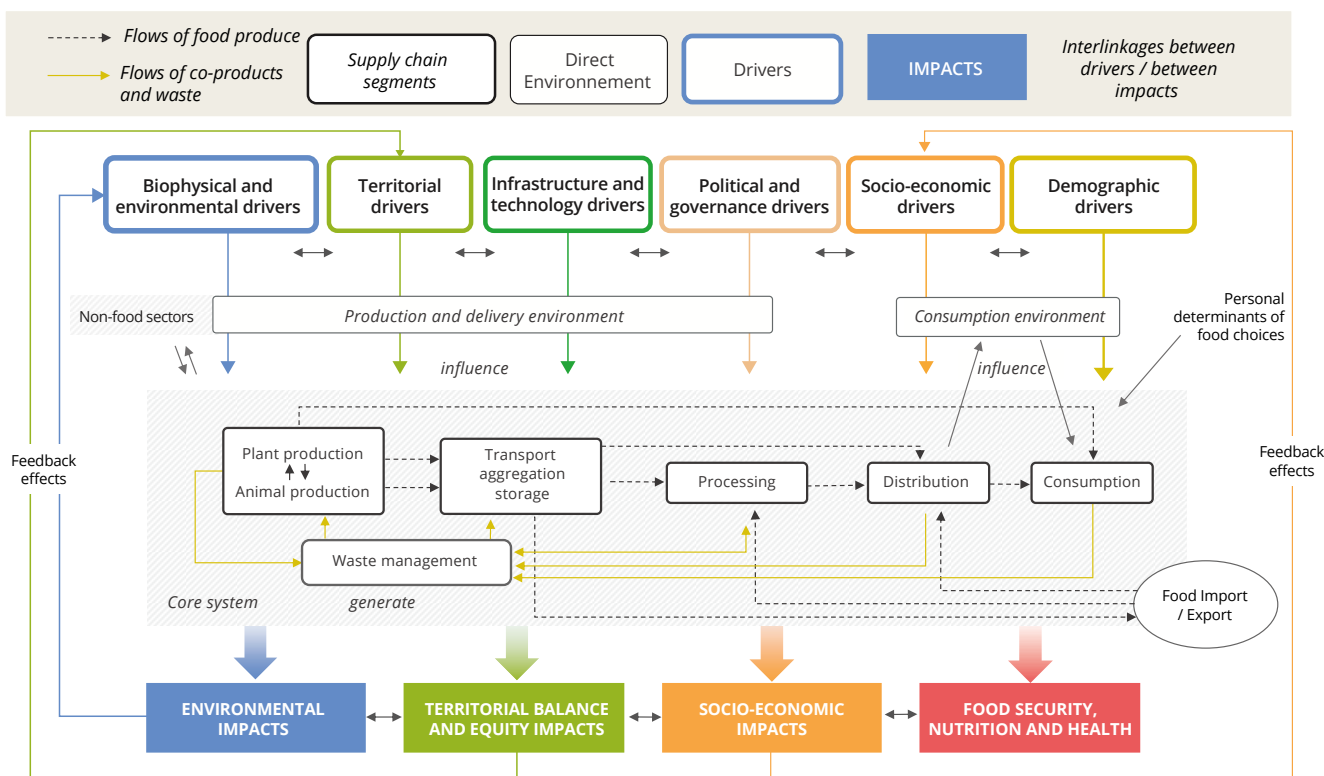


Food Systems Assessment Methodology and Process

This brief is the result of a collaboration between FAO, the European Union, CIRAD in close collaboration with national institutions and FAO experts. It was implemented in Nepal in 2021. The methodology used for preparing this brief is the result of a global initiative of the European Union, FAO and CIRAD to support the **sustainable and inclusive transformation of food systems**. This assessment methodology is described in detail in the 2021 joint publication entitled *Catalysing the sustainable and inclusive transformation of food systems: conceptual framework and method for national and territorial assessment*.

The assessment integrates qualitative and quantitative data analysis with participatory processes by mobilizing public, private and civil society stakeholders. The approach includes interviews with key stakeholders and a consultation workshop to refine systemic understanding of the food system and discuss potential levers to improve its sustainability. The assessment process thus initiates participatory analysis and stakeholder discussion on the strategic opportunities and constraints to sustainable transformation of food systems. The approach assesses the actors and their activities at the core of the system, together with their interactions along the food chain as well as the environments directly influencing their behaviour. Conditioned by long-term drivers, these actors generate impacts in different dimensions that in turn influence drivers via a number of feedback loops (see Figure 1).

Figure 1. Analytical representation of the food system



Source: Catalysing the sustainable and inclusive transformation of food systems: Methodological note, FAO, 2021.



The approach involves a detailed understanding of the key challenges along the four dimensions of sustainable and inclusive food systems: (i) food security, nutrition and health: (ii) inclusive economic growth, jobs and livelihoods: (iii) sustainable natural resource use and environment: and (iv) territorial balance and equity. Aimed at identifying critical issues affecting the sustainability and inclusivity of food systems, the assessment is both qualitative and quantitative in nature. Critical challenges and key food systems dynamics are specified in the form of **Key Sustainability Questions** (KSQs), whose answers (see schematic representations for all KSQs) help identify systemic levers and areas of action that are essential to bring about desired transformations in food systems.

This approach is designed as a preliminary rapid assessment for food systems and can be implemented over a period of 8–12 weeks. The methodology has been applied in more than 50 countries as a first step to support the transition towards sustainable food systems.

National context: key figures

<p>Population, total (2021)¹: 30.3 million</p> <p>Population growth (2019)²: 1.8%</p> <p>Urban population growth (2019)²: 20.1%</p> <p>Gini Index (2010)²: 38.2</p> <p>National GDP per capita (2018)²: 2741, PPP 2011</p> <p>Share of Agri-Food System in GDP³: 49%</p>	<p>Access to electricity (2017)²: 95%</p> <p>Mobile cellular subscriptions (2018)²: 139%</p> <p>Global Gender Gap Index (2020)⁴: 0.680</p> <p>Labour force with at least basic education (2018)⁵: 73%</p> <p>Forest area as a proportion of total land (2015)⁶: 25%</p>
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Sources: ⁽¹⁾ Central Bureau of Statistics, Nepal: ⁽²⁾ World Bank Indicators: ⁽³⁾ Thurlow, 2021: ⁽⁴⁾ World Economic Forum: ⁽⁵⁾ ILOSTAT,

⁽⁶⁾ UNStats (SDG Indicators).



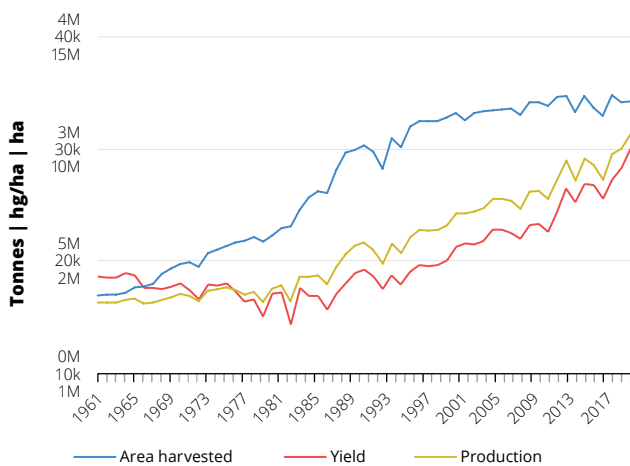


Key figures and trends in the agricultural and food sector

Agriculture is one of the main sources of livelihood for two-thirds of households. However, 51.8 percent of households are still food insecure and 25.2 percent are under the poverty line (Sharma and Pudasaini, 2020).

The major cash crops are oilseed, potato, tobacco, sugarcane, jute, cotton, and rubber. The major cereal crops are paddy, maize, millet, wheat, barley, and buckwheat. Cardamom, ginger, garlic, turmeric, silk cocoons, honey and mushroom are also produced in copious amounts. Rice is the principal crop, with the biggest area of cultivation (42.5 percent of total cereal area) and yield (51.6 percent of total cereal production) and it contributes 20 percent of total agricultural GDP. Nepal has shown some improvement in food production, with area, production and productivity of cereal crops increased since the 1960s (see Figure 2). The positive achievements, however, were not sufficient to satisfy demand and this is set to continue. In comparison to the food deficit in 2020, the deficit by 2035 is projected to increase by 31.2 percent for cereals, 65.6 percent for vegetables, 162.8 percent for pulses, 26.4 percent for oilseeds, and 59.4 percent for fruits (Sharma and Pudasaini, 2020).

Figure 2. Trend of total cereal production in Nepal 1961–2019



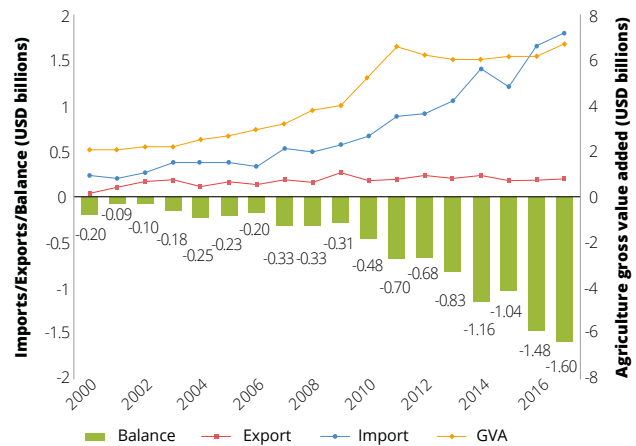
Source: FAOSTAT, 2019.

Nepal thus faces a growing negative trade balance in agricultural produce, that has never been positive since 1986 (Sharma and Pudasaini, 2020).

From USD 195 million of agricultural products imported in 2000, the figure reached USD 1.4 billion in 2017 (Figure 3). India remains the main source of agricultural imports, representing almost 70 percent of imports (mainly agricultural equipment, chemical fertilizer, rice, and vegetables). On the other hand, exports of agricultural products did not increase as fast as imports: they represented USD 50 million in 2000 and USD 182 million in 2017 (mainly to India, with food and livestock representing over 90 percent).

Exports to India would benefit from being more diversified and competitive, but limitations include various factors, such as insufficient infrastructure, high transport costs, weak sanitary capacity and lack of adequate development finance. Low levels of technological development,

Figure 3. Imports, exports, trade balance and gross value added of agriculture sector in Nepal 2000–2017



Source: Sharma and Pudasaini, 2020.



insufficient managerial skills and lack of other skills are also hurdles.

With agriculture the biggest contributor to GDP, Nepal's government is committed to uplifting the

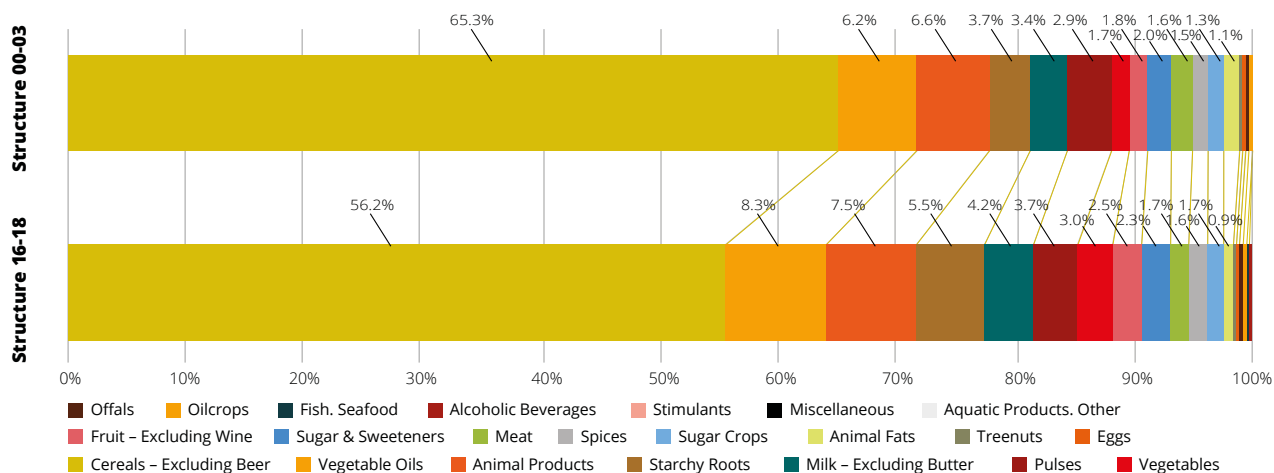
sector, focusing on modernization, diversification, improving products, commercialization and marketing. The government therefore plans to make available inputs, such as irrigation, electricity, transportation, and agro-credit (FNCCI, undated).

Key figures and trends in food consumption

The Nepal Annual Household Survey 2015/16 (CBS, 2016) reported that more than 80 percent (by value) of food for household consumption was purchased in markets, with only 15 percent from home production. Household expenditure patterns also revealed that food purchasing trends are quite similar throughout Nepal, from rural to urban areas, hills to Terai, though with slight differences in the mountains (where a lower proportion of food was purchased from markets). In the 2016/17 survey, the largest share of food expenditure is for grain and cereals (27.9 percent), followed by meat and fish (16.1 percent) and vegetables (12.4 percent). Per capita consumption of basic staple foods, measured in kg/year, shows Nepal's population consumed about 336.9 kg on average – with figures similar in urban and rural areas.

Average annual consumption of some major foods included coarse rice (68.9 kg), fine rice (43.0 kg), potato (29.9 kg) and wheat (21.2 kg) in 2016/17. The per capita consumption in Nepal in 2015/16 was 38.5 kg of fine rice and 92.8 kg of coarse rice. The poorest 20 percent consume 249.8 kg of basic staple foods (such as rice, potatoes and wheat) whereas the richest 20 percent consume 420.9 kg. This consumption pattern evolving over 20 years showed cereal intake is decreasing relatively, while vegetable oil, animal products, starchy roots, milk, vegetable and fruit intake is increasing (CBS 2016). These changes showed average annual consumption of calories from cereals decreased from 65.3 percent (2000–02) to 56.2 percent (2016-18), and increasingly came from other foodstuffs (Figure 4), including vegetable oils, animal products, starchy roots and tubers and pulses.

Figure 4. Total kcal percentage intake by major groups of foods, comparison between 2000-2002 and 2016-2018 average



Source: FAOSTAT, 2020.

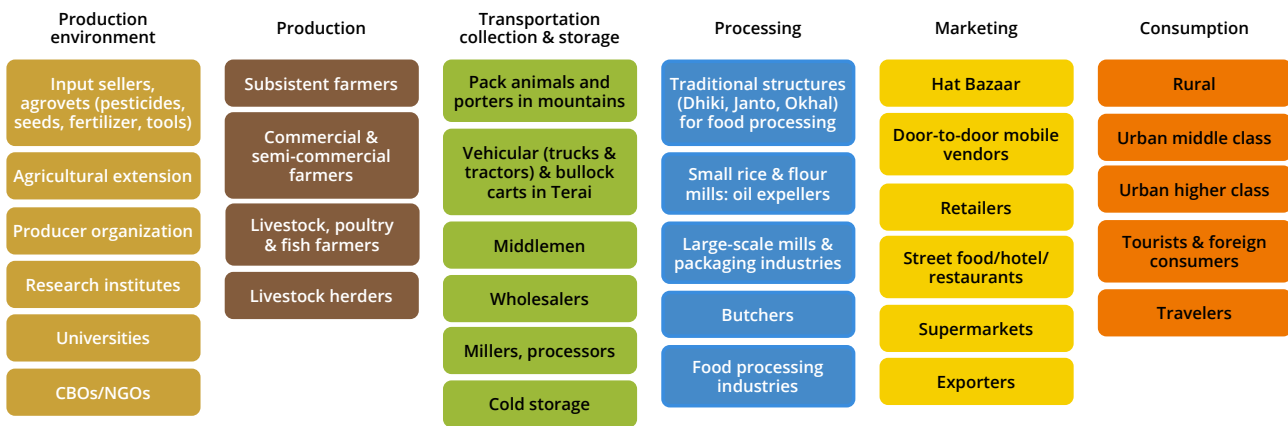


Mapping of actors and activities

Food production, transportation, processing and marketing in Nepal are dominated by individual entrepreneurs or very small

enterprises, though there has been consistent growth in the role of large-scale mills and packaging industries.

Figure 5. Map of actors and activities (CBO, community-based organization; NGO, non-governmental organization)



Source: FAOSTAT, 2017.

Key challenges with respect to the four fundamental goals of a sustainable food system

Reduce malnutrition through accessible, good quality food and health care

Food security is a prominent concern in Nepal. Only 48.2 percent of households meet the minimum level of food security and 21 percent of the population do not have enough food to eat, partly due to increasing food prices. Most regions in high hills and mountains in Provinces 6 and 7 experience high food insecurity.

Some progress was achieved in reducing malnutrition between 1996 and 2016, but then appeared to plateau. During this period, the prevalence of stunting (low height for age) among children under five decreased from 57 percent to 36 percent (MoH *et al.*, 2017), the prevalence of underweight (low weight for age) reduced from 42 percent to 27 percent and wasting (low weight for height) from 15 percent to 10 percent. Anaemia is still a widespread problem that needs to be addressed urgently: prevalence increased

from 46 percent in 2011 to 53 percent in 2016 among children aged 6–59 months, and from 35 percent to 41 percent among women of reproductive age over the same time period (MoH *et al.*, 2017; MoH *et al.*, 2012).

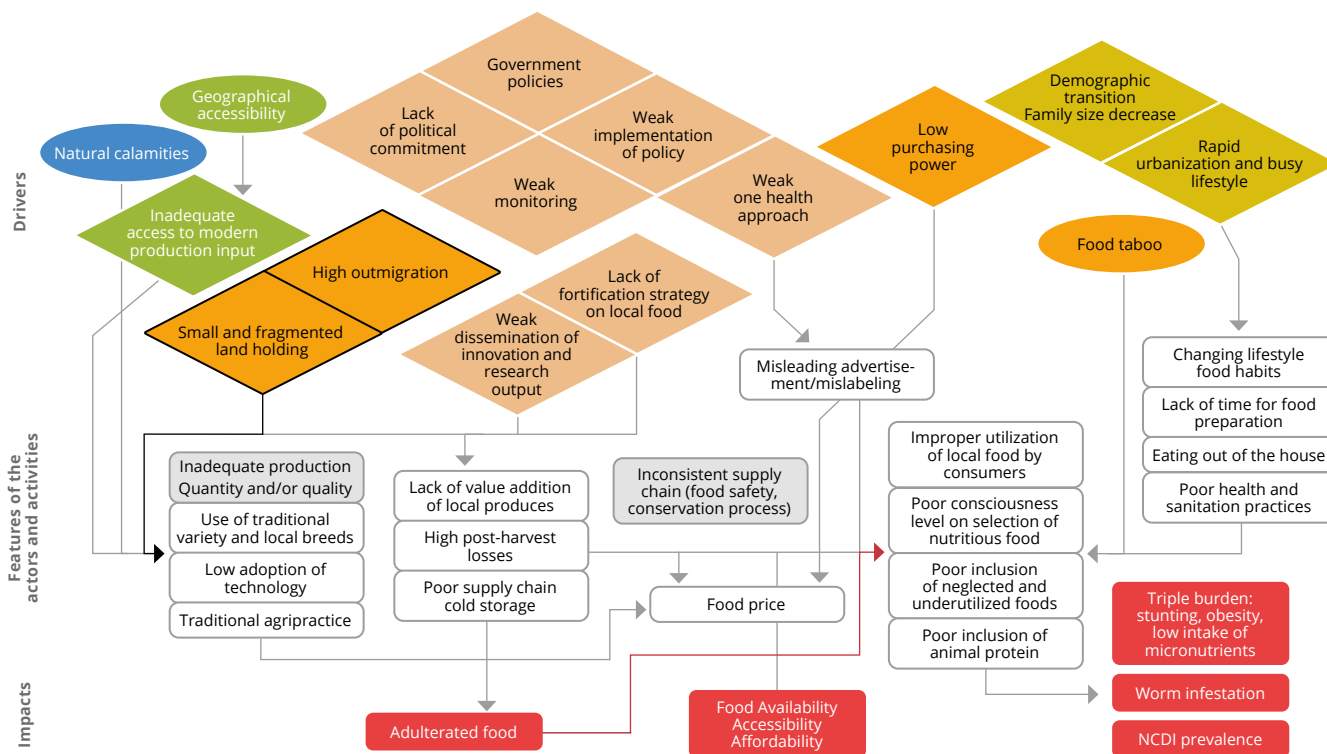
Food security, nutrition and health

Under-nourishment ¹	27%
Stunting ¹	36%
Obesity ¹	22% (overweight & obesity in women)
Anaemia ¹	53% children & 41% women
Salt ²	87% households using refined iodized salt
Protein ¹	72.3 g/cap/day (2017)
Micronutrients ¹	Zinc deficiency in 21% children (6-59 months) Vit A deficiency in 8.5% children & 7.0% pregnant women

Source: ⁽¹⁾MoH *et al.*, (2017); ⁽²⁾ MoHP *et al.*, (2018).



Figure 6. The Food System in relation to the Food Security, Nutrition and Health dimension



Source: Authors.

Insufficient access to good-quality food, inadequate healthcare, and poor care practices are contributing factors to the triple burden of food insecurity, malnutrition and poor health conditions. More than a quarter of the population consumes inadequate food or the minimal acceptable diet.

The mean food consumption score of households in Nepal is 65.2, a number considered acceptable at the national scale, though a more critical situation exists in specific areas or among particular population groups. Sixteen percent of households have inadequate food consumption and 9.7 percent of households have poor dietary diversity. An urban/rural divide persists, with 10.1 percent of households having inadequate food consumption in urban areas, compared to 20.1 percent of households in rural areas. Poverty is also a strong determinant of the quality of the food diet. Households in the poorest fifth of the population are 12 times more likely to consume an inadequate diet (low food consumption score)

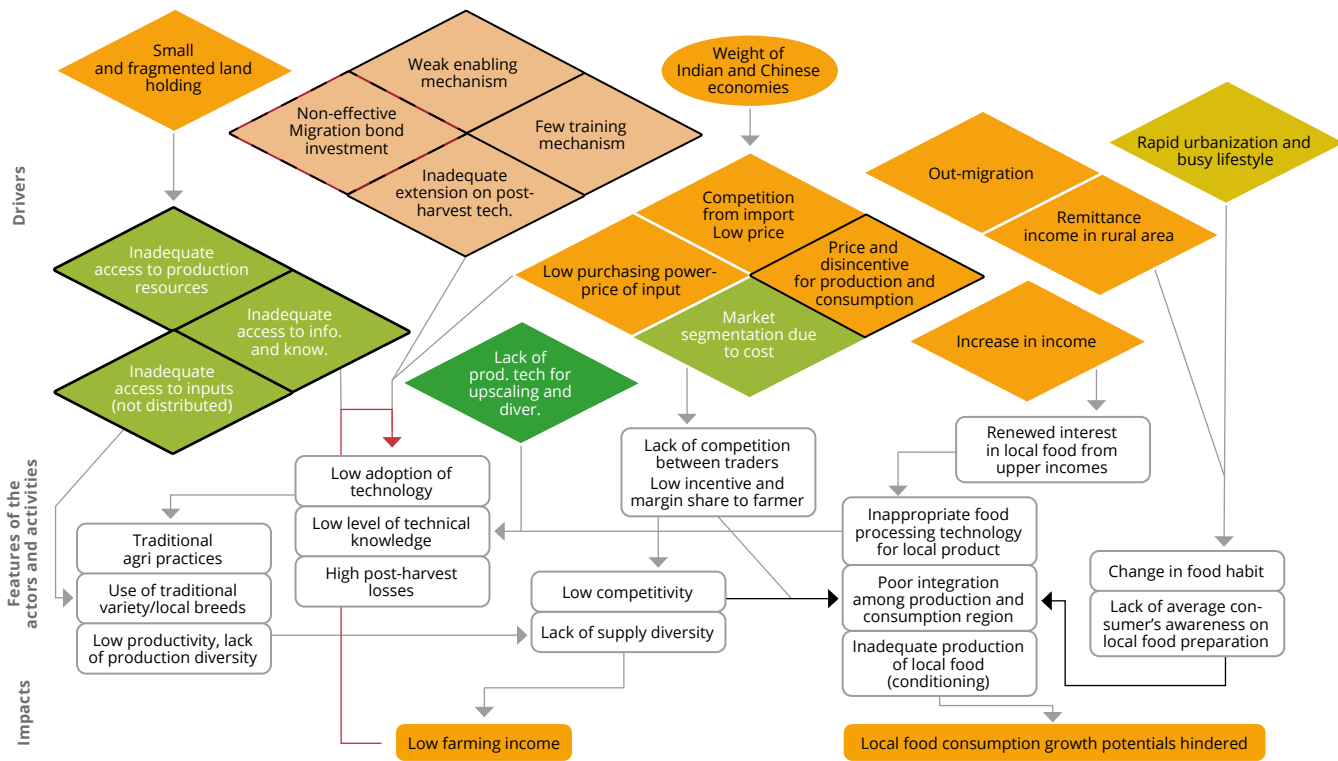
compared to households in the richest fifth (CBS, GoN, Annual Household Survey 2016/17).

Nepal's system of food production on small plots is uncompetitive compared to India, and outward migration worsens the labour shortage in agriculture

The distribution of agricultural land is uneven, as the majority of small farmers operate only 18 percent of the total agricultural land, with an average land holding size of less than 0.5 hectare, making mechanization impractical. Farmers' access to basic inputs (irrigation, fertilizers and seeds) is limited and they rely mostly on traditional knowledge, local varieties and breeds (Shivakoti *et al.*, 2005), in fragile sloping land in rural areas away from market centres. This is due to both difficult access to modern production inputs in some parts of the country (hills and mountains) and low purchasing power even in the southern plains, where access to some production inputs is relatively better.



Figure 7. The Food System in relation to the Socio-economic dimension



Source: Authors.

Low income for farmers in the Terai region is also related to unfavourable competition between traditional farming on small and fragmented land holdings in Nepal and production in India.

Production mainly depends on timely and adequate rainfall, as only one-third of cultivated land has assured irrigation facilities (MoEWRI, 2018). As a result, commercial farming is practised mainly in high-potential production niches of the Terai and river basins around market centres with access to irrigation and roads (ILO, 2019).

Almost 6 percent of Nepal's population works abroad. Increased migration has created labour shortages, with negative impact on agriculture. In total, between 1993 and 2012, nearly 2.5 million people migrated to different countries for work (Pant, 2013). Remittances received by agricultural households from those who have moved away are not used to buy the necessary equipment to replace their lost labour, leading to yield losses.

Socio-economy

Employment in agriculture (2019) ¹	70%
National GDP per capita, PPP (2018) ¹	USD 2741 constant 2011
Agriculture, forestry and fishing value added per worker (2019) ¹	USD 599 constant 2010
Cereal ratio dependency (2015-17) ²	13%

Colours represent the comparison of the situation in Nepal with low-income and lower-middle income countries. Green represents a situation comparatively better (upper quintile) and red comparatively worse (lower quintile).

Sources: ⁽¹⁾ World Bank, ⁽²⁾ FAOSTAT.



Productivity of the Nepalese food system suffers from poor institutional coordination at all tiers of government and from gender-based wage disparity

The constitutional Right to Food and Food Sovereignty Act (2018), cites a need for “mutual coordination” between the three tiers of government, but the administrative structure currently lacks clarity on roles and responsibilities. Ambiguity in defining the functions, and the lack of capacity and funds at local level to implement policies, may slow the pace of development.

As the implementation of federalism proceeds in Nepal, inter-dependency will grow deeper between the three tiers of government.

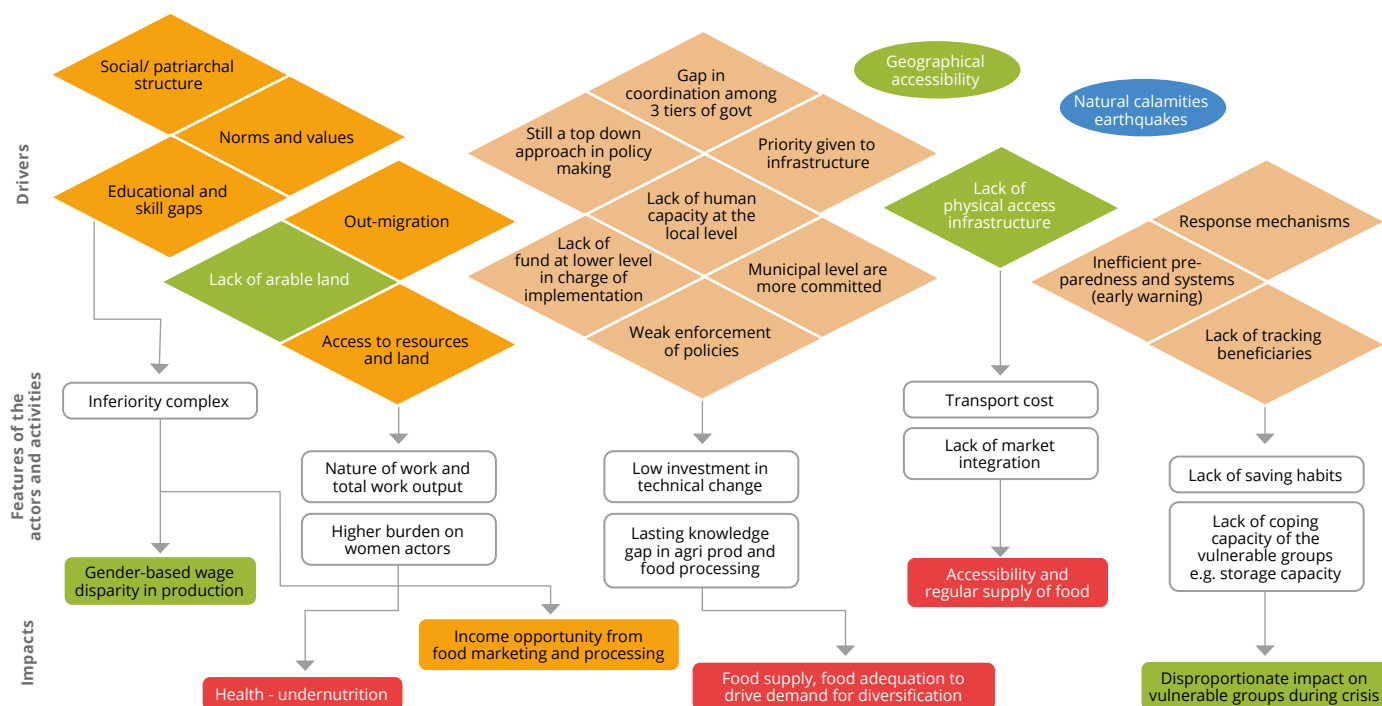
The exodus of male workers has led to the feminization of farming (80 percent of women work in agriculture: FAO, 2019) and increased workloads for women, who need to balance additional agricultural responsibilities and household work. Women also tend to be disadvantaged in seeking off-farm employment and earn less as farm labourers (Sunam and McCarthy, 2016). Moreover, farms managed

Governance

Governance effectiveness Index WGI (2019) ¹	-1.04
Conflict-related displacement (2016) ²	50000 IDP
Gender gap of the labour force with at least basic education (2017) ³	31 points
Employment in agriculture, female (2019) ³	80%
Colours represent the comparison of the situation in Nepal with low-income and lower-middle income countries. Green represents a situation comparatively better (upper quintile) and red comparatively worse (lower quintile).	

Sources: ⁽¹⁾ Worldwide Governance Indicators World Bank, ⁽²⁾ IDMC (2016), ⁽³⁾ World Bank.

Figure 8. The Food System in relation to the Territorial Balance and Equity dimension



Source: Authors.



by women produce less value per hectare than those managed by men, through lower access to and use of technology (FAO, 2019).

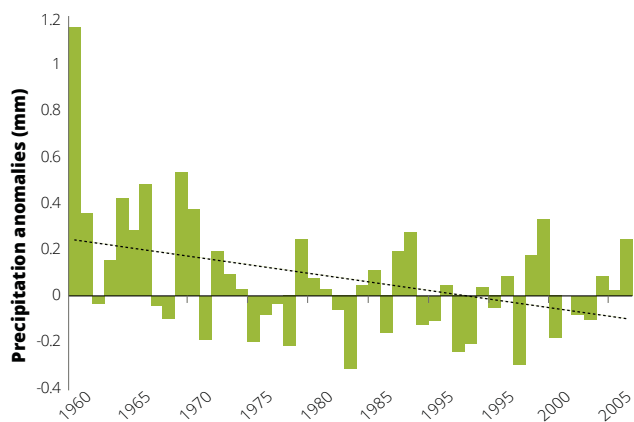
Women in agricultural labour received wages 26 percent lower than men in 2011 despite equal workloads, although the government has made efforts to address discrimination in remuneration. Recognizing the crucial role of women in food systems and the gender disparity in wages are crucial issues to address, to enhance inclusiveness and sustainability of Nepal's food systems.

Production practices impact negatively on fragile mountain ecosystems and natural resources

Nepalese agriculture is highly dependent on natural resources, with low levels of irrigation. Average annual precipitation is 1,311 mm (averaged over 1960-2015) ranging from less than 200 mm in Mustang, Manang and Dolpa to more than 5,000 mm around the Lumle area (USAID,

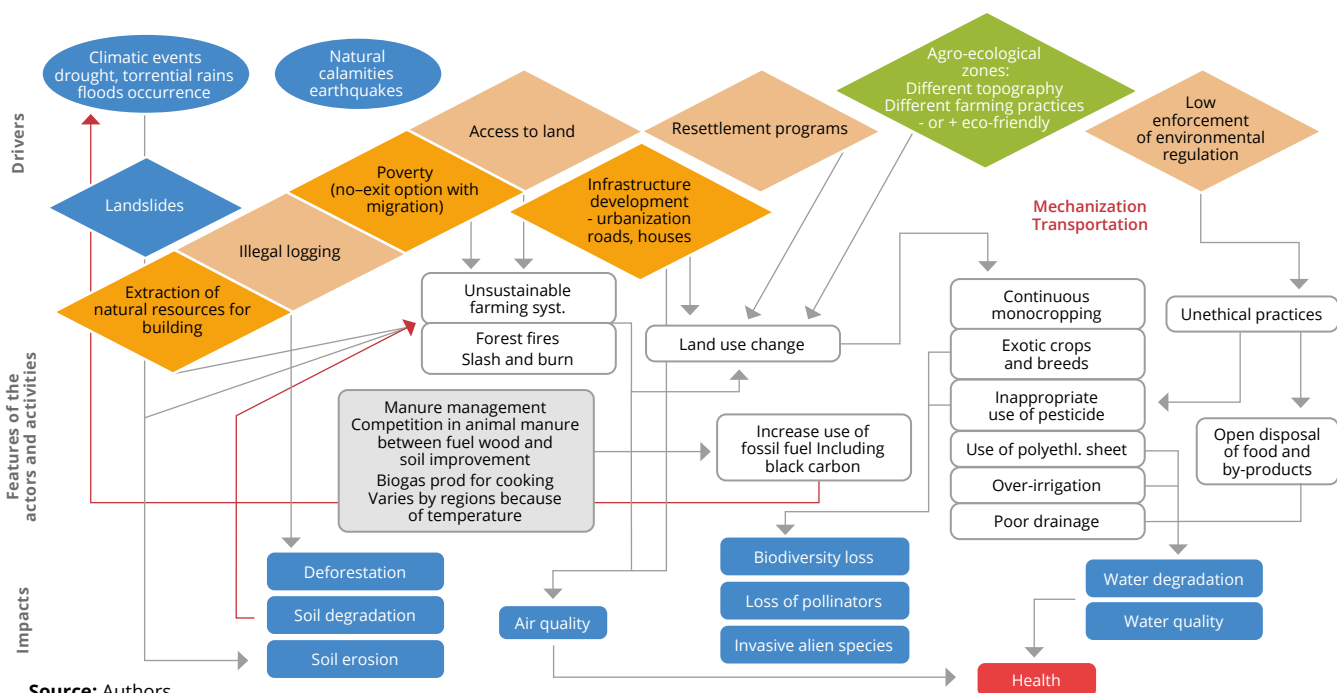
2017). Monsoon rain occurs between June and September and contributes 60–80 percent of the annual rainfall. As presented in Figure 10, precipitation in Nepal tended to decline between 1960 and 2005, with high inter-annual variability making it very difficult for farmers to adapt.

Figure 10. Precipitation anomaly trends in Nepal (average of the whole country), 1960-2005



Source: McSweeney et al., 2010.

Figure 9. The Food System in relation to the Environment dimension



Source: Authors.



Over three-quarters of the territory is categorized as hills and mountains with slope gradients varying from gentle to steep. The soils are naturally fragile, prone to erosion, landslides and of poor fertility. They degrade under the effect of agricultural and animal production practices (low input of organic matter, seasonal soil cover, overgrazing) along with climatic (torrential rain) and anthropogenic hazards (forest fire, deforestation, haphazard infrastructure development without consideration to ecological issues). Excessive use of pesticides in commercial production of vegetable and cash crops (tea, coffee and tobacco) occurs mainly in urban and peri-urban areas, and open disposal of food waste and by-products can pollute downstream water.

Forest cover is deteriorating due to encroachment (directly related to population growth), slash-and-

burn practices, timber extraction, overgrazing and over-reliance on forest products. It is estimated that 3.16 million hectares have been affected by the land-degradation process, representing 11.81 percent of the total area of Nepal (MoEST, 2008). Of the 3.16 million hectares affected by degradation, approximately 38 percent of forest lands, 37 percent of pasture/rangeland and 10 percent of agricultural land were seriously degraded. Human-induced activities such as overgrazing, unsustainable farming, excessive use of chemical fertilizers and hazardous pesticides, and deforestation have resulted in the loss of topsoil and biodiversity. Nepal contributes only about half (<2 t/cap) of the world average CO₂ emissions (<3.9 t/cap) (MoE, 2011), but greenhouse gas emissions are increasing, mainly caused by rising use of fossil fuels, agricultural mechanization, forest fires and burning of black carbon.

Environment

Water stress (2006) ¹	8.3%
Deforestation/year (2000–2015) ²	<0.1% slowing down in the past 20 years
CO ₂ emission/ha (2017) ³	5,448 kg/ha
Energy use ³	1.3%
Colours represent the comparison of the situation in Nepal with low-income and lower-middle income countries. Green represents a situation comparatively better (upper quintile) and red comparatively worse (lower quintile).	

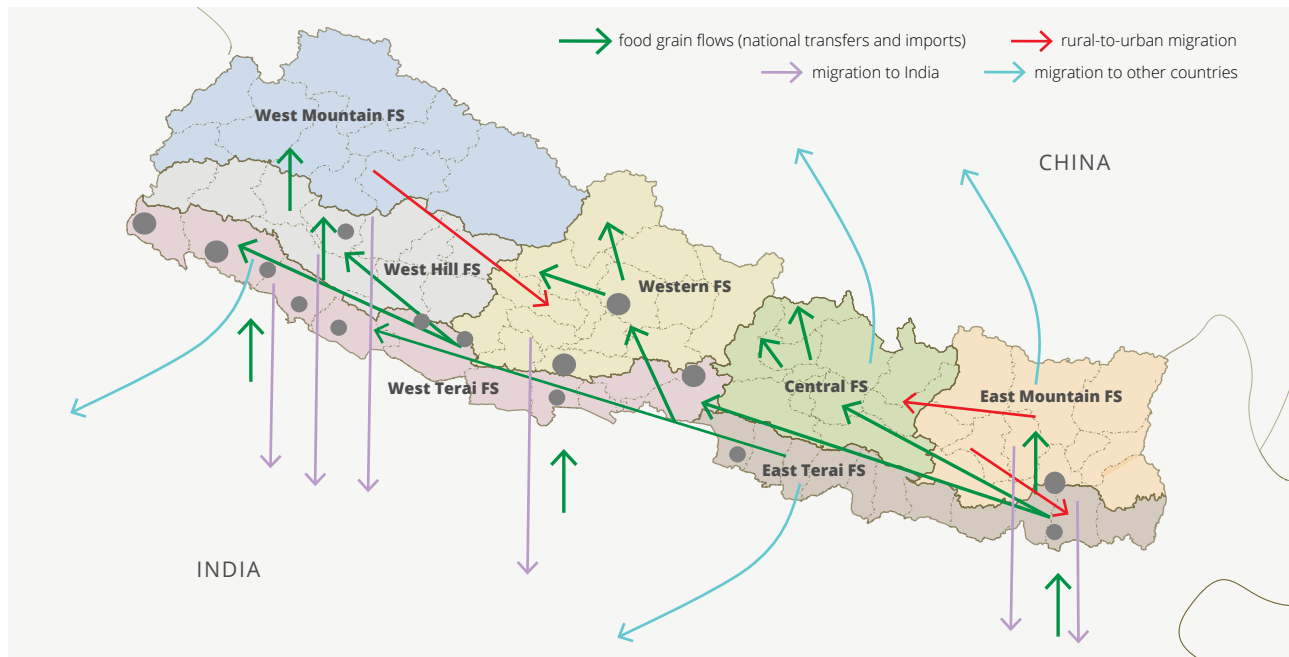
Sources: ⁽¹⁾ FAO Aquastat, ⁽²⁾ UNStats, ⁽³⁾ FAOSTAT.





Mapping of the food systems

Figure 11. Mapping of food systems



Source: United Nations Geospatial, 2020.

FS1 - West Mountain Food System: North-western Nepal is predominantly hills and mountains, with rugged topography, challenging climate and difficult economic and livelihood settings. Precipitation is low and dry conditions prevail. There are limited road networks and minimal developed infrastructure, with no urbanization. Production is based on subsistence and huge gaps exist between output and needs. Limited imports of food are brought in via the West Hill region. The region experiences chronic food insecurity and seasonal out-migration is frequent to urban areas in Nepal, as well as to India.

FS2 - East Mountain Food System: This system prevails in the North-Eastern part of Nepal. The area is predominantly hills and mountains, providing a gateway to Nepal for monsoon rains, and it mostly receives good precipitation. There are limited road networks and little infrastructure development in the region, leading to no urbanization. Food production is mainly subsistence-based, but pockets also produce tea and cardamom on

a commercial scale. The region is sufficient in rice production (DoA, 2018), but falls short of requirements in other foods. Moderate food insecurity exists in the region, with the deficit covered by food imports from East Terai region. Out-migration occurs mostly to urban locations in Nepal, as well as international destinations, including India.

FS3 - West Hill Food System: This system lies in the far western part of Nepal between the Western Mountain Food System to the north and West Terai Food System to the south. The area is predominantly hilly. The northern side of the region receives low rainfall. There are limited road networks and infrastructure. Urbanization has begun in a few places, but the region remains mostly rural. The food production system is mainly subsistence-based, with livestock an important component and major source of protein. Livestock also supply manure for maintaining land fertility and draught power for land preparation and transportation. Food production is insufficient to meet needs and the



deficit is covered by food brought in from West Terai. High food insecurity exists in the region. Seasonal out-migration prevails among youths, mostly to India.

FS4 - Western Food System: This system in the North-West part of Nepal is predominantly hills and mountains. Most of the region receives good rainfall, except in the rain shadow area to the north of mountains in the Tibetan plateau. Road networks and infrastructure development are comparatively better than in other regions and as a result, urbanization is faster. Food production is generally subsistent, but vegetable production at commercial and semi-commercial level has become common in and around urban and peri-urban areas. The region is a popular destination for tourists, and related businesses have flourished, with great further potential for promoting agro-tourism. Food output is average, with the major crops being paddy, maize, millet and wheat. Cash crops include potatoes, coffee, apple and oranges. There is also rearing of livestock. Moderate food insecurity exists in the region, with the deficit met through imports from East Terai region. There is some seasonal migration to India.

FS5 - Central Food System: This system exists in the North-Central part of Nepal. The area is predominantly hills and mountains, occupying about 42 percent of the total land area and including the capital, Kathmandu. This region receives significant attention from the government, benefits from good access to basic facilities such as transportation, education, communication, drinking water, sanitation, electricity and healthcare facilities. Most of the region receives good rainfall. It has the best HDI (Human Development Index) and per capita income in Nepal. Road networks and infrastructure development in this region are advanced and there has been rapid urbanization. The food production system is generally subsistent in nature, but vegetable production at a commercial and semi-commercial scale has become common in and around urban and peri-urban areas. Large-scale agro-based industries are situated in this region. Food production is insufficient to meet requirements, with the deficit met through imports of food from East Terai or India. High market availability of processed foods has contributed to increased obesity in the region. Out-migration is common among youths bound for international destinations.





FS6 - West Terai Food System: This system exists in the South-West part of Nepal. The area is predominantly flat land in the Terai. Most of the region receives average rainfall. The road networks and infrastructure development in this region are comparatively good, but urbanization is occurring at a slower pace. Commercial and subsistent production practices exist in the region. Major products are rice, wheat, maize, peas, lentils, mustard, potatoes and vegetables. Bananas are becoming very popular in the Terai region, where they are grown commercially. Productivity is average and high food insecurity exists in the region, which also faces high malnutrition. Stunting, wasting, underweight and anaemia are widespread. Food is imported from the East Terai region and from India. Out-migration to international destinations is common among youths.

FS7 - East Terai Food System: This system exists in the South-East part of Nepal. The area is predominantly flat land in the Terai. Most of the region receives high rainfall. The road networks and infrastructure development and urbanization are proceeding at a medium pace. The area is known for good agricultural production, with fertile, flat land providing great opportunity where surface irrigation is easiest. Floods, however, pose a threat during the rainy season. The region produces a variety of crops – including cereals, vegetables, fruits and tea – and production is highly commercialized. Fish farming is also a major source of income. Both commercial and subsistent production practices exist in the region. Food is imported from India to supply other regions in Nepal. Out-migration is mostly to international destinations, including India, and to urban locations. The region has a good opportunity to serve as Nepal's food basket, though undernutrition remains prevalent, with stunting, wasting, underweight and anaemia.

Proposed areas of intervention to improve the sustainability of the food system

The results of the assessment and participatory consultations suggest that Nepal's transition to a sustainable food system will need to address multiple issues, including low productivity, low competitiveness of the food trade system, inadequate infrastructure, labour migration, insufficient services, gender inequity and persistent nutrition problems. These indicate broad areas for potential action to address the challenges and opportunities highlighted in the assessment.

The main levers identified during consultations with stakeholders were: (1) Improving the **efficiency of value chains** to enhance distribution of quality food and limit post-harvest losses, by optimizing processing, storage and marketing practices and strategies; (2) implementing **livelihood support strategies** for the poorest (social protection, cash transfer,

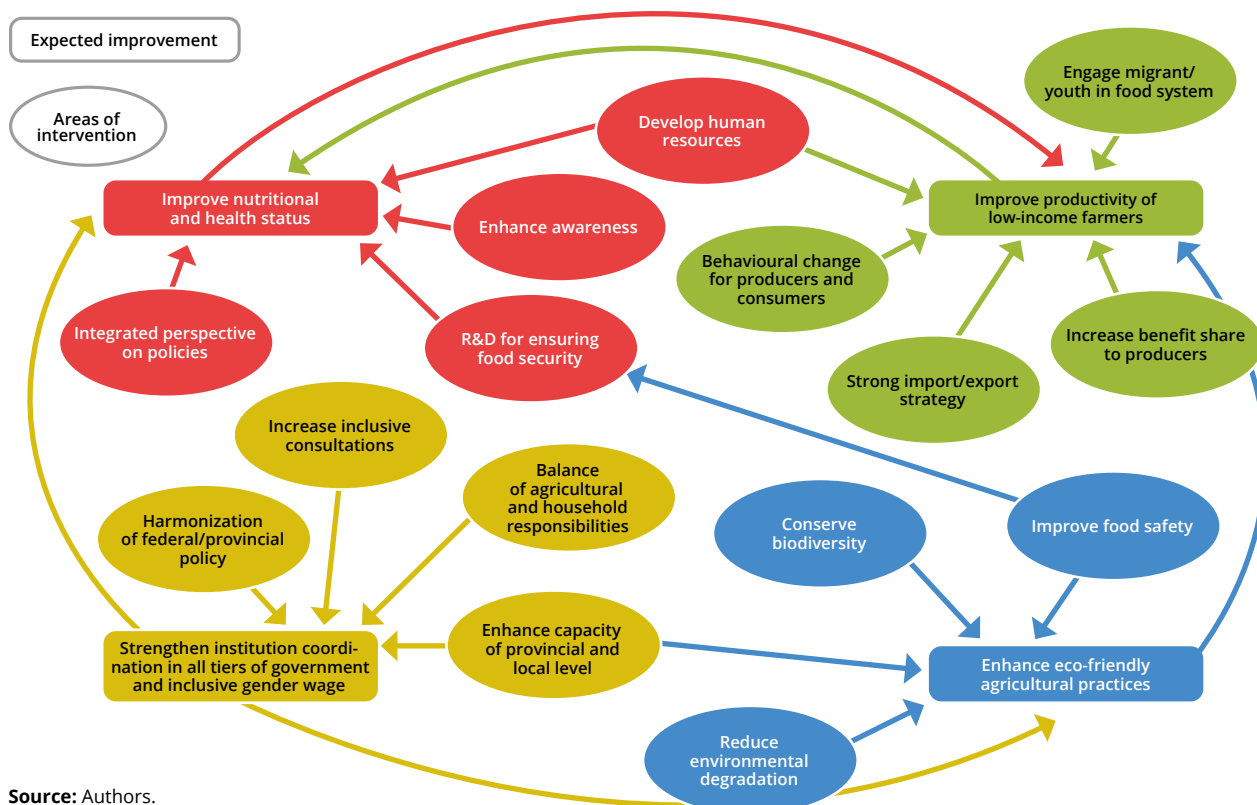
employment schemes); (3) reinforcing the legal framework and capacities of local authorities during federalization; (4) **improving land-use planning** to strengthen supply chains and food security; (5) promoting **small-scale mechanization** in order to support **women** in rural areas to keep cultivating and **prevent land being left fallow**; (6) **improving capacity of storage and processing to raise competitiveness of local products compared to those from India.**

Lever 1: Improve the efficiency of value chains

This lever is expected to: (1) **improve the public distribution and availability** of good quality local food products in the market, encouraging their consumption and improving food security; (2) reduce the length of value chains and number



Figure 12. Proposed areas of intervention to improve the sustainability of the food system



Source: Authors.

of intermediaries to **limit product losses** during processing; and (3) **avoid spoiling products** by using appropriate transport, and where produce is spoiled to use it as animal feed.

This lever would need to ensure good functioning of markets, by improving road conditions (enabling strategic warehousing and transportation) and better dissemination of market information. Education and awareness are necessary, both for farmers (to promote adoption of local varieties likely to minimize losses, to target the best harvest times, and encourage processing and packaging) and consumer awareness of the benefits of local products.

Implementation of this lever could be hindered by a **lack of coordination** between actors, a **lack of access to information and training** and the low level of farmers' primary education.

Nepal could also benefit from considering India's example that has shown reducing intermediaries in the value chain can reduce costs and improve coordination.

Lever 2: Implement livelihood support strategies for the poorest

This lever is expected to increase the **availability of food intake** and **diversify the diet** with nutritious food, with contributions such as social protection, cash transfers and employment schemes.

For this lever to be effective, several conditions need to be fulfilled: organizing **food supply in remote and food-deficit areas**, supporting the **production of nutritious food** (not only supporting rice) and **small home gardens in urban areas** to diversify diet, **improving post-harvest technology**



to improve nutrition and provide income, especially for women, and considering **fortification of some food products**. This lever will also need an effective funding plan.

Implementation would depend on **access to budget resources, institutional capacity of local government** to implement the scheme, and overall **food supplies** from local or imported sources.

Various successful experiences in the country are relevant: (1) UNICEF's support for Nepal's government to implement a Multi-Sector Nutrition Plan whereby women's groups receive small grants to create **small home gardens to generate income**; (2) **cash grants for nutrition** (feeding young children in the most food insecure areas, combining local food with supplements) with support to small businesses; (3) **mid-day meal for pupils**; (4) **World Food Programme's Cash for Work activities**.

Lever 3: Reinforce the legal framework and capacities of local authorities

This lever is expected to:

- **Clarify the roles and functioning of the three levels of governance and how they can cooperate.** In this way, it should be possible to understand how different policies fit together – such as sovereignty and the right to food – fit together at federal level and **local level**.
- **Produce useful data** (such as on biodiversity at the local level, and means to offer proper disaster response mechanisms).
- **Better protect indigenous crops and food.**

Implementation will need **harmonization between policies at federal and provincial levels**, combined with improved **capacities at provincial and local level**. **Regulation will need to define roles and accountability** in governance as well as in the private sector, related to food consumption and the environment. **This lever would help to shape federal-level policies and build on provincial realities and experiences.**





Implementation of this lever could be hindered by **lack of ownership at local level**, where federal authorities formulate policy with no support or enforcement at the provincial level, or by a **lack of local accountability and capacity to implement strategies**, or due to **local conflicts of interest**. If a situation of hunger should arise, **potential conflict between communities and local government** should be prevented, with federalization helping to ensure more sustainable and inclusive food systems.

Lever 4: Improve land use planning to strengthen the supply chain and food security

This lever is expected to: (1) **enforce land use acts**; (2) **protect fertile land** (from losses, erosion, etc.); (3) **regulate construction** of houses and roads on **agricultural land**; and (4) **reduce production costs** related to the size of the land, by facilitating tenancy.

This lever could be implemented through: (1) **land consolidation through farmers' cooperatives** which could reinforce farmers'

agricultural productivity; (2) **establishment of scientific land classification** for better knowledge of agricultural suitability of land for crops; (3) **strengthen and guarantee the application of regulations and legal support** especially relating to land use legislation, to allow people to lease land without risk of losing it; (4) **creation of a land bank** and better **coordination regarding land use legislation and policies**; and (5) **ensure timely supply of inputs**.

An efficient coordination system would contribute to the implementation of this lever, which could also be affected by the **interest of municipalities in changing land use** to allow building of roads, houses, etc. (generating more taxes).

Lever 5: Promote small-scale mechanization to avoid land being left fallow

This lever is expected to: (1) keep land cultivable by maintaining terraces, irrigation infrastructure and biomass input; (2) **limit rural to urban migration and associated territorial fragmentation**; (3) **reduce women's**





drudgery and increase job opportunities in rural areas; (4) **increase food production to enhance food intake and decrease malnutrition as well as reduce food imports.**

This lever would need **an action plan** for the implementation **of policy for women-friendly technology** to reduce drudgery. **Improving women's access to resources** (land and capital) and **developing better services and infrastructure** (schools, health facilities, roads and markets) would contribute to raising productivity and improving livelihoods in rural areas. **Efforts to keep land cultivated could also rely on implementing a policy to support reallocation of fallow land** (taxes on fallow land, creation of a land bank and good mapping of the fallow areas to monitor the situation).

Implementation of this lever could be hindered by **the issue of land ownership**, which needs to be addressed to prevent **land-tenure conflicts**. Actions and programmes also need to ensure decreased **drudgery for women**.

Lever 6: Improve storage and processing capacity to increase competitiveness of local products compared to those from India

This lever is expected to **improve connectivity** and linkages in the food system and **improve the economic situation of participants in the system.**

In effective implementation of this lever, there is a role for encouraging farmers to focus on crops with high nutritive and cultural value and which also tolerate the effects of climate change. There is also potential in persuading consumers to use local products, which could benefit local producers and contribute to improved competitiveness. This would also be supported by: investments in production and marketing infrastructure (irrigation

systems, storage, processing facilities, local markets); strengthening of value and marketing chains and connecting farmers with markets (particularly during emergencies such as the COVID-19 pandemic); and national regulations and incentives. Other aspects could include price regulations, such as negotiations **with India about import barriers and a more functional support for prices** (linking with procurement capacity for emergencies); input subsidies and improved access to financial institutions to improve farming profitability; and stricter quality control on imports (e.g. regarding chemical residues).

Implementation of this lever could be hindered by: (1) increased **risks in prices and marketing**, and (2) **risk of food losses** if consumers are deterred by high product prices or if products are lost or spoiled before reaching them.

Other levers could involve: (1) **improved land use management** to ensure land access and tackle the issue of land conversion from agricultural to urban use; (2) promoting local genetic material, local varieties and diversification to preserve **biodiversity and adapt to climate change**; (3) **improved infrastructure and technologies for transport and storage**; (4) **water quality and appropriate pesticide use**; (5) the Constitution provisioned the **right to food and food sovereignty**; (6) **Improved coordination in policies** and interventions; (7) **Support and encouragement for farmers to invest in agricultural production**, as their current low returns discourage investment.

This assessment is a contribution to building knowledge about Nepal's food systems and presents results and avenues of intervention that need to be deepened, through more dialogue between the various sectors and the relevant actors, in order to move towards a more sustainable food system.





References

- Acharya BN.** 2014. *Biosecurity Assessment for the Field Crops and Vegetables*. In: Biosecurity Status of Food and Agriculture in Nepal. Pant KP, Sareen S and Sharma RP (Eds.). Food and Agriculture Organization of the United Nations (FAO), Nepal.
- Central Bureau of Statistics, National Planning.** 2016/2017. *The Annual Household Survey*.
- Department of Agriculture (DoA).** 2018. *Inter Provincial Dependency for Agricultural Development*. Kathmandu, Nepal, Department of Agriculture.
- Department of Water Resources and Irrigation (DoWRI).** 2019. *Irrigation Master Plan 2019*. <http://dwri.gov.np/documents/documents/1603184416.pdf>
- FAO** 2019. *Country Gender Assessment of Agriculture and the Rural Sector in Nepal Nepal*. Rome, FAO. ISBN: 978-92-5-131269-8 (Available at: <http://www.fao.org/3/CA3128EN/ca3128en.pdf>)
- FAO Aquastat**, <https://www.fao.org/aquastat/en/>
- FAOSTAT**, <https://www.fao.org/faostat/en/#home>
- Federation of Nepalese Chambers of Commerce and Industries (FNCCI).** Undated. Agriculture. Kathmandu, Nepal. (Available at: www.fncci.org/agriculture-148.html)
- Internal Displacement Monitoring Centre (IDMC).** 2016. *Global Report on Internal Displacement 2016*. Internal Displacement Monitoring Centre, Geneva, Switzerland. (Available at: <https://www.internal-displacement.org/globalreport2016>)
- International Labour Organization (ILO).** 2019. *Eight Ways to Grow Nepal's Agricultural Sector. A Rapid Market Assessment and Ranking of Agricultural Sub-Sectors*. International Labour Organization (ILO), Geneva, Switzerland. ISBN: 978-92-2-133721-8.
- Jacquet S, Kohler T and Gudrun S.** 2016. *The effects of migration on livelihoods: land management, and vulnerability to natural disasters in the Harpan Watershed in Western Nepal*. Mountain Research and Development, 36(4):494–505.
- Luitel DR, Siwakoti M, Joshi MD, Rangaswami M and Jha PK.** 2020. *Potential suitable habitat of Eleusine coracana (L) Gaertn (Finger millet) under the climate change scenarios in Nepal*. BMC Ecol (2020) 20:19.
- Ministry of Health (MoH), New ERA & ICF.** 2017. *Nepal Demographic and Health Survey 2016*. Ministry of Health, Kathmandu, Nepal. (Available from: <https://www.mohp.gov.np/eng/publications/nepal-demographic-health-survey>).
- Ministry of Health and Population (MoHP), New ERA, & ICF International.** 2012. *Nepal Demographic and Health Survey 2011*. Ministry of Health and Population, Kathmandu, Nepal. (Available from: <https://www.mohp.gov.np/eng/publications/nepal-demographic-health-survey>).
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Ministry of Health and Population (MoHP), New Era, UNICEF, EU, USAID & CDC. 2018. *Nepal National Micronutrient Status Survey (NNMSS) 2016*. Kathmandu, Nepal.

Ministry of Environment (MoE). 2011. *Status of Climate Change in Nepal*. Ministry of Environment, Kathmandu, Nepal.

Ministry of Environment, Science and Technology (MoEST). 2008. *Nepal Thematic Assessment Report: Land Degradation*. Ministry of Environment, Science and Technology, Kathmandu, Nepal.

Ministry of Energy, Water Resource and Irrigation (MoEWRI). 2018. *Present Status of Energy, Water Resource and Irrigation Sector and Future Road Map (White Paper)*. Ministry of Energy, Water Resource and Irrigation, Nepal.

Ministry of Population and Environment (MoPE). 2016. *Nationally Determined Contributions*. Nepal.

Nepalese Journal of Agricultural Economics (NJAE). Vol. 1, No 1, September 2011.

Pant KP. 2014. Status of Biosecurity in Nepal: Policy Perspective. In: *Biosecurity Status of Food and Agriculture in Nepal*. Pant KP, Sareen S and Sharma RP (Eds.). Food and Agriculture Organization of the United Nations (FAO), Nepal.

Pant, Krishna. 2018. *Effects of Labour Migration on Poverty and Agricultural Growth in Nepal*. Journal of Agriculture and Environment. 14. 87. 10.3126/aej.v14i0.19789.

Sharma M and Pudasaini A. 2020. Where is Nepal in the food system transition? *South Asian Journal of Social Studies and Economics*, 8(4): 16–36.

Shivakoti G, Ghale Y and Upreti B. (2005). The ecological dynamics of low external input agriculture: a case study of hill farming in a developing country. *International Journal of Sustainable Development & World Ecology*, 12(4): 385–397.

Sunam, Ramesh and McCarthy J. 2016. Reconsidering the links between poverty, international labour migration, and agrarian change: critical insights from Nepal. *The Journal of Peasant Studies*. 43(1): 39–63.

Thurlow J. 2021. *Beyond Agriculture: Measuring Agri-Food System GDP and Employment*. [PIM webinar]. IFPRI, Washington DC. <https://pim.cgiar.org/2021/03/30/beyond-agriculture-measuring-agri-food-system-gdp-and-employment/>

USAID. 2017. *Climate Risk in Nepal: Country Risk Profile*. Washington DC, USAID.

World Bank 2021. *On the Road to Sustainable Growth: Measuring Access for Rural Populations*. (Undated).



Acknowledgements

This brief is the result of a collaboration between the NPC, European Union, FAO and CIRAD. It is part of the initiative *Catalysing the sustainable and inclusive transformation of food systems*.

The following people contributed to this note: *Ojeswee Pande, Uma Koirala, Madhu Subedi (consultants), Frédéric Lançon (CIRAD), Nicolo Massa Bernucci (FAO), Shrawan Adhikari, Saha Binod (FAO/Kathmandu), Stéphane David (EEAS/Kathmandu), Hélène David-Benz, Claire Orbell, Ninon Sirdey (CIRAD), Patrick Herlant, James Tefft, Steven Watkins (FAO).*

Editing and formatting: *Rex Merrifield, Polly Butowsky.*

