SOUTH ASIA DISCUSSION PAPERS

FOOD SECURITY IN SOUTH ASIA






NUS National University of Singapore

ISAS Institute of South Asian Studies

Editors
Puspa Sharma
Saeeduddin Faridi

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Introduction: Many Facets of Food Insecurity in South Asia

Puspa Sharma

Over the years, most South Asian countries have made good progress in many of these aspects of food precarity.

Globally, food precarity is examined in several ways. It is looked at in terms of hunger, undernourishment, child stunting and wasting (also child mortality), and capability to afford a healthy diet, among others. Over the years, most South Asian countries have made good progress in many of these aspects of food precarity. Yet, more than 300 million people in South Asia – the highest number among all the regions in the world – continue to suffer from undernourishment.

According to the latest State of Food Security and Nutrition Report 2023, the prevalence of undernourishment in the total population and stunting in children under five are high in South Asia, particularly in some of the countries in the region (Table 1). A large number of women in these countries suffer from anaemia, and around two-thirds of South Asia's population is unable to afford a healthy diet.

Table 1: Prevalence of Undernourishment and Stunting (%)

	Prevalence of undernourishment in total population		Prevalence of stunting in children under five	
	2004-2006	2020-2022	2012	2022
Afghanistan	34.5	30.1	44.3	33.1
Bangladesh	13.7	11.2	39.2	26.4
Bhutan	NA	NA	30.2	22.7
India	21.4	16.6	41.6	31.7
Maldives	NA	NA	16.4	13.9
Nepal	17.0	5.4	40.3	26.7
Pakistan	17.1	18.5	43.8	34.0
Sri Lanka	13.9	5.3	16.7	15.9
Southern Asia	19.6	15.9	40.3	30.5
World	12.0	9.2	26.3	22.3

Source: FAO. 2023. State of Food Security and Nutrition Report 2023. Rome: Food and Agriculture Organization of the United Nations.

The latest Global Hunger Index (GHI) Report 2023 also provided a grim picture of the state of hunger in South Asia, particularly in Afghanistan, India and Pakistan which were among the lowest ranked 25 countries in the GHI out of 125 countries. The findings of these global reports have been questioned and refuted, especially by India.[1] There could be some merit in questioning the methodologies, analyses and findings of the report, but there is no denying that food insecurity, in the general sense of the term, is a grave concern in South Asia. The fact that around 800 million people in India rely on the public distribution of food shows the precarity of food insecurity in the region.

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By definition, food security depends on four factors: availability of food, access to food, food utilisation and stability of these three conditions over time. The availability of food is ensured either through self-production of adequate food or making adequate food available in the market. For those who are not engaged in food production, buying food from the market is the main source of their food availability. However, even in the case of food self-production, only a few can make all kinds of food available for themselves through self-production, if they can do so at all. For the foods that are not self-produced, even the food producers need to depend on external sources, mainly the market. Hence, access to food is necessary for food security. This entails, among other things, having the means (mainly income) to purchase food and ensuring the affordability of food prices.

The third condition for food security is to ensure that the food that is available and accessible is also utilisable. This is possible when the minimum required quality and nutrition in the food are ensured. When these three conditions are met, the fourth and final, equally important condition, for food security is the need for these three conditions to remain stable over time. In other words, there should be sustainability and continuity in these three conditions.

[1] For a discussion on the controversies, see Puspa Sharma, "Revisiting the Controversy on Hunger and Food Security in South Asia", *ISAS Working Paper No. 371*, 2024, Institute of South Asian Studies, National University of Singapore, https://www.isas.nus.edu.sg/wp-content/uploads/2024/02/ISAS-WP-Food-Security-DC-PS-HK-DC-50_HK3-HS.pdf.

Most of these South Asian countries' current state of food security is worse than it was in 2018.

The Global Food Security Index (GFSI) is perhaps the only database that provides the state of countries' food security comprehensively in all these four dimensions separately and as a single index. The South Asian countries' standing in the GFSI in 2022 out of 113 countries for which data were available is shown in Table 2. India's score of 58.9/100 in the overall food security environment (which is a combination of the affordability, availability, quality and safety, and sustainability and adaptation dimensions) places it at the 68th rank out of 113 countries, and the best among the five South Asian countries included in the table. Pakistan has the worst food security environment among the five South Asian countries. Most of these South Asian countries' current state of food security is worse than it was in 2018. One of the reasons could be the impact of COVID-19.

Of the four individual dimensions of food security, the listed five South Asian countries appear to be doing relatively well in ensuring food availability but poorly in access (affordability), utilisation (quality and safety) and stability (sustainability and adaptation) dimensions. To make significant improvements in the overall food security environment in South Asia, it is essential to make improvements in all four dimensions.

Table 2: State of Food Security in South Asia, 2022

	Food Security Environment		Affordability		Availability		Quality and Safety		Sustainability and Adaptation	
	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank
India	58.9	68	59.3	80	62.3	42	62.1	67	51.2	71
Nepal	56.9	74	52.7	85	70.9	13	57.8	72	46.2	84
Sri Lanka	55.2	79	61.0	74	57.2	64	55.0	81	45.3	87
Bangladesh	54.0	80	52.1	87	61.5	46	58.4	71	43.9	93
Pakistan	52.2	84	59.9	75	58.3	61	49.4	97	37.7	106

Note: Data for the other three South Asian countries is not available.
Source: Economist Impact, Global Food Security Index 2022, https://impact.economist.com/sustainability/project/food-security-index/.

Several factors affect the four dimensions of food security. There could be common and/or distinct factors influencing the four dimensions and, hence, the overall food insecurity in different South Asian countries. For example, in largely agricultural countries, food availability for a majority of its population is dependent on the capacity to self-produce food at the household level. This necessitates access to land, agricultural inputs such as seed and fertiliser and irrigation facilities. For the others, food availability needs to be ensured through markets. In countries where domestic agricultural production is not sufficient to meet domestic food requirements, food imports become the means to ensure availability. Therefore, food availability is dependent on the countries' trade policies and trade relationships. Frictions in regional and global trade impact food availability.

Access to food, or affordability, is particularly determined by people's income and the price of food products. The lack of adequate income or high food prices affect food access. Factors that affect food utilisation include poor food quality, lack of hygiene and improper handling of food. The fourth dimension, that is, the stability of the first three dimensions, is extremely important for food security. The stability of the availability dimension is impacted by several factors, such as continuity in land ownership and access to agricultural inputs, but more importantly, in recent times, by the effects of climate change on agricultural production. Similarly, stability in the access to food is determined by the continuous availability of adequate income, besides several other factors.

The lack of adequate income or high food prices affect food access.

A complete assessment of current or future food security at the national, household or regional level needs to take all of these and many other factors into consideration. This is a huge endeavour. This issue of the Institute of South Asian Studies' South Asia Discussion Papers covers some of the important issues, particularly in relation to the current state of food security in South Asia. There are eight chapters, each on an individual South Asian country, in this volume. The chapters discuss some of the country-specific food security issues.

The country had made progress in hunger reduction during the first two decades of the 2000s but it could not be sustained.

Fazlullah Akhtar and Zaneta Kubik, in their paper, 'State of Food Insecurity in Afghanistan and Coping Strategies', state that Afghanistan has one of the worst food crises in the world. They provide an overview of how the food security situation in Afghanistan has evolved over the past two decades. The country had made progress in hunger reduction during the first two decades of the 2000s but it could not be sustained. Various factors have contributed to the precarious food security situation in Afghanistan. These include conflict, political and macroeconomic instability, poverty, limited income-earning opportunities and forced displacement, among others.

These have been aggravated by declining donor funding, climate change-induced floods and droughts, and several structural challenges, including underperforming infrastructure, education and health systems, and gender disparities. The authors also highlight the complexities that have arisen due to the rigid approach adopted by the current Taliban regime, along with their disregard for human rights and international rules and regulations. The authors state that potential strategies and interventions that could help mitigate the food insecurity-associated challenges in Afghanistan include changes in agricultural practices, ensuring market accessibility, strengthening social safety nets, and fostering international aid agencies' cooperation.

In the case of Bangladesh, Fahmida Khatun writes that Bangladesh has achieved success in agriculture growth and food production, particularly rice production, over the years. This has made the country self-sufficient in food. However, this has not translated into food security for the masses.

Considering the multi-dimensional nature of food security, Bangladesh lags behind most South Asian countries, as shown in the GFSI report 2022.[2] The author states that some of the key drivers of food insecurity in Bangladesh are high inflationary pressures, macroeconomic

[2] "Global Food Security Index 2022", *The Economist*, 2022, https://impact.economist.com/sustainability/project/food-security-index/.

shocks, market manipulation by cartels and adverse effects of climate change. The author discusses these drivers in some detail in the paper. In offering recommendations to address the challenges of food insecurity, she focuses on the need for effective government actions and policy reforms targeting the key drivers of food insecurity.

Bhutan is regarded as a champion in environmental sustainability. In its efforts to ensure food security, Bhutan has integrated agriculture, livestock and environmental conservation, which Dil B Rahut, Chandra Shekhar Dhakal and Raja Rajendra Timilsina argue in their paper, serves as a model to the world. They claim that Bhutan has achieved self-sufficiency in a number of agricultural products. One of the top priorities of the Bhutan government has been achieving self-sufficiency in rice, a staple of the country. However, paddy-harvested areas have been shrinking over time, and so there has been a decline in rice production, which has increased Bhutan's dependence on rice imports.

One of the top priorities of the Bhutan government has been achieving self-sufficiency in rice, a staple of the country.

Despite the importance of agriculture to Bhutan, public investment in agriculture and the contribution of agriculture to Bhutan's gross domestic product and employment has decreased over time. Other challenges in the country's agriculture sector include the lack of adequate arable land, inability in technology adoption, climate change impacts on agriculture, human-wildlife conflict and policy incoherence and inconsistency.

To address Bhutan's challenges in the agriculture sector, the country's 13th Five Year Plan (2024-2029) has aimed to promote large-scale commercial farming, support subsistence farming, develop high-value export products, enhance agricultural ecosystem services for sustainable biodiversity, improve governance and strengthen the business system to encourage private sector involvement. The paper also provides several recommendations to further address the challenges.

India, an emerging global power and the most populous country in the world, presents a unique case on food security. Biswajit Dhar

writes that over the past several decades, India has become one of the largest food producers, particularly of major cereals, in the world. However, at the same time, it also has the largest number of undernourished people globally. Even some of the countries in South Asia, namely, Nepal, Sri Lanka and the Maldives, have a better dietary energy supply per capita than that of India. India's success in reducing undernourishment in a decade was reversed in four years after 2018.

Although different welfare schemes have been instituted to help people in distress, including food security, the schemes have not been effective.

The author highlights that the objective of food security in India is constrained by the lack of people's purchasing power and inefficient food distribution systems. Although different welfare schemes have been instituted to help people in distress, including food security, the schemes have not been effective. The paper also notes the recent reductions in allocations for India's two major welfare schemes: the implementation of the Mahatma Gandhi National Rural Employment Guarantee Act and the National Food Security Act.

India's adoption and implementation of green revolution technologies in agriculture, starting in the 1960s, had contributed to adequate cereal production in the country. In recent years, the impact of climate change on agriculture has started to surface. For instance, there have been reductions in wheat output due to heat stress. The paper analyses the challenges to India's agriculture and food security in the face of emerging climate-induced threats that it will have to contend with. It provides recommendations for two sets of policy interventions that are urgently required to address India's food insecurity.

The Maldives stands in stark contrast with India and the other South Asian countries. It is the only island nation in South Asia and the smallest of them all. Less than 10 per cent of the Maldives' land area is considered arable. This is one of the reasons, Fathimath Shafeeqa writes in her paper, that less than 10 per cent of the Maldives' national food requirement is met through domestic production. Ninety per cent of its overall food requirement and 100 per cent of its staple food requirement, comprising flour, rice and sugar, are met through imports. This makes the Maldives vulnerable to supply chain disruptions, currency fluctuations and trade barriers.

Dependence on the markets, particularly imports, for the Maldivians' food requirements means that adequate incomes are necessary to ensure access to food. The tourism and fisheries sectors are the drivers of the Maldives' economic growth and revenue generation. The impacts of climate change on these sectors have been a major concern for the Maldivians incomes and, hence, their food security. Saltwater intrusion into freshwater sources due to climate change-induced events has also disrupted the limited domestic food production and distribution systems in the Maldives.

The tourism and fisheries sectors are the drivers of the Maldives' economic growth and revenue generation.

The author provides several recommendations to cope with the food security challenges facing the country. Some of these include encouraging diversification of food sources to reduce reliance on imports, promoting domestic production of fruits, vegetables and crops that are well-suited to the Maldivian climate, promoting climate-resilient farming practices and many more.

The paper on Nepal by Yamuna Ghale focuses on the country's food security in the context of massive youth outmigration from the country. The author argues that there have been both positive and negative impacts of youth outmigration on Nepal's food security. On the positive side, the remittances received by the migrants' families in Nepal have enabled their access to food. The downside of the huge outmigration of the youth from the country has been that it has created labour shortages and negatively impacted the agriculture sector, which is crucial for food security.

The author argues that the positive effects are short-term and not sustainable. Reversing the migration trends and creating opportunities at home is essential for long-term, sustainable food security. For this, the author proposes a '5-R' strategy: Retention, Return, Reintegration, Remittance management and Reversal of migration trend.

In the case of Pakistan, Muhammad Umar Farrukh, Muhammad Khalid Bashir and Sajjad Hyder have conducted a Broad-Spectrum Analysis of food security based on systematic reviews of several published articles that cover various aspects of food security in Pakistan. They

Small agricultural landholders face difficulty in accessing markets, agricultural inputs, technology and credit.

find that the multidimensional nature of socioeconomic disparities in Pakistan intersects with food insecurity in the country. There is a huge rural-urban divide, with the urban area benefitting from every economic sector, whether manufacturing or services. However, even within the rural and urban areas, there are huge inequalities, which have had an impact on the food security of those at the bottom. For example, in rural areas, land holdings and distributions are highly unequal. Non-farm incomes are essential for the poor to achieve food security, but non-farm jobs are scarce in rural areas. Small agricultural landholders face difficulty in accessing markets, agricultural inputs, technology and credit.

The authors find that economic policies such as the structural adjustment programmes have adversely affected the marginalised groups in Pakistan. They argue that the economic policies focused on liberalisation often led to food inflation, which hurt the poor the most. The authors suggest that addressing the various forms of inequality in Pakistan is necessary to address the problem of food insecurity.

In the final paper in this volume, Manoj Thibbotuwawa explores the state of food security in Sri Lanka in the aftermath of the government ban on the import and use of chemical fertilisers in 2021. The paper mainly focuses on the impact of the ban on domestic food production and its effect on food security. The author finds that after the ban on chemical fertilisers, there was a significant reduction in food production in Sri Lanka.

While the reason cited for the imposition of the ban was to make Sri Lanka an organic food-producing country, the government banned fertiliser imports also with a view to managing the shortage of foreign exchange that the country was facing at that time. However, due to the reduction in domestic food production after the ban, Sri Lanka had to substantially increase its food imports, which did not help achieve the objective of managing its foreign exchange shortages. The reduced domestic food production and a rise in food imports led to a rise in food prices, which affected Sri Lankans' food access. This should serve as a lesson for Sri Lanka and other countries on the need

to consider several related aspects when devising public policies on agriculture and food security.

State of Food Insecurity in Afghanistan and Coping Strategies

Fazlullah Akhtar and Zaneta Kubik

Introduction

Food security is defined by its four dimensions, that is, food availability, access, utilisation and stability.

Food security is central to human life and livelihood and a basic need in line with the "right to adequate food approach".[1] It is understood as a situation where "all people, at all times, have physical and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life."[2] Food security is defined by its four dimensions, that is, food availability, access, utilisation and stability. The availability of accessible food resources tackles the supply aspect of food security, with the levels of food insecurity being shaped by factors like food production, stock quantity and trade. Food access, both physical and economic, considers the households' capacity to access food and is influenced by factors such as income and purchasing power, prices and markets. Food utilisation mainly refers to how the nutrients present in food contribute to human growth and energy production. It depends on feeding practices, dietary diversification, food preparation as well as intra-household food distribution. Finally, stability refers to the sustainability of all the above three factors.

Food security has multifaceted impacts on countries and their populations. Most importantly, food security is essential for human health and for peoples' physical and cognitive development. In a corollary to that, food security may have important implications for productivity, incomes and welfare, and efficiency achievements at the aggregate economy level.[3] Food insecurity can directly affect productivity and other labour market outcomes of working-age

1 Food and Agriculture Organisation of the United Nations, "The right to food. Voluntary guidelines to support the progressive realization of the right to adequate food in the context of national food security", *FAO*, 2005.

2 D J Shaw, "1996 World Food Security: A History since 1945", Springer, 2007.

3 Z Kubik, A Mirzabaev, and J May, "Climate Change, Food and Nutrition Security, and Human Capital". In: Zimmermann, K F (eds) *Handbook of Labor, Human Resources and Population Economics*, Springer, 2023, https://doi.org/10.1007/978-3-319-57365-6_333-1; J R Behrman, "The economic rationale for investing in nutrition in developing countries", World Dev 21(11):1749-1771, 1993.

individuals. It can also have indirect effects on children through pre-school abilities, school learning and broader cognitive development. Such effects determine the impact at an aggregate economic level. The negative impacts exacerbate poverty, inequality and social unrest, which are all prevailing in many low-income countries.[4]

Hunger and malnutrition are still widespread across the world. Despite a prolonged period of decline, global hunger has increased since 2015. In 2020, nearly one-third of the population in the world lacked adequate food access, with an estimated 720-811 million people facing hunger, mostly in Asia (418 million).[5]

In 2020, nearly one-third of the population in the world lacked adequate food access, with an estimated 720-811 million people facing hunger, mostly in Asia (418 million).

For decades, food security has been a major concern for Afghanistan. Following decades of war, close to half of the Afghan population faced hunger as of 2001.[6] In response, the government took steps to address the issue. In 2012, it introduced the Afghanistan Food Security and Nutrition Agenda (AFSANA),[7] a comprehensive strategic and policy framework aimed at tackling the country's food insecurity challenges. This framework outlined the approaches to uplift information management of food and nutrition across the country. It also drew objectives, relevant methodologies, tools and operational priorities for an effective monitoring and evaluation mechanism.

AFSANA had several objectives. One of the primary strategic aims was to assure food availability for all Afghans. A second strategic objective was to improve their economic and physical access to food with a special focus on vulnerable and food-insecure populations across the country. Another goal of the policy was to stabilise the food supply and ensure provision even during adverse conditions. This was to be achieved by establishing a response mechanism for

4 O Shrikant, A N S Parihar and A Ahmed, "Analysis of the effects of child malnutrition on school outcomes, cognitive development, and gross domestic product (GDP): A systematic review", *International Journal*, 2020.

5 FAO, IFAD, UNICEF, WFP, WHO, "The State of Food Security and Nutrition in the World 2021. Transforming food systems for food security, improved nutrition and affordable healthy diets for all", 2021.

6 Center for Development Research, Food and Agriculture Organization of the United Nations, "Investment costs and policy action opportunities for reaching a world without hunger (SDG2", Joint Report, 2020, https://openknowledge.fao.org/server/api/core/bitstreams/ca2f109d-31d0-46b7-99b5-f8d6cf668a7b/content.

7 GoIRA, "Afghanistan Food Security and Nutrition Agenda (AFSANA): A Policy and Strategic Framework", 2013, https://www.gafspfund.org/sites/default/files/inline-files/6c.%20Afghanistan_Agriculture%20and%20Food%20Security%20Strategy.pdf.

disaster preparedness through measures such as strategic grain reserves. AFSANA also aimed to promote healthy diets, adequate food utilisation and quality nutrition, especially for women and children.[8] However, despite initial improvements in food security, relative to the 2001 levels, the prevalence of undernourishment and acute food insecurity is again on the rise in Afghanistan.

These factors not only exacerbate existing challenges but also directly contribute to food insecurity in the country.

This paper aims to provide details about the current state of food security in Afghanistan and how it has evolved over the past two decades. It discusses the numerous factors that contribute to the precarious situation, including but not limited to conflict, climate change, economic instability and inadequate infrastructure. Furthermore, the paper also explores potential strategies and interventions that could help mitigate the food insecurity-associated challenges, including agricultural practices, market accessibility, social safety nets and fostering international aid agencies' cooperation. In addition, this paper highlights the complexities that have emerged as a result of the rigid approach adopted by de facto authorities in Afghanistan, along with their disregard for human rights and international rules and regulations. These factors not only exacerbate existing challenges but also directly contribute to food insecurity in the country.

Current State of Food Insecurity in Afghanistan

Afghanistan has a record of protracted food insecurity. Over the past years, it has consistently been classified among the countries with the worst food crises in the world.[9] Although Afghanistan has registered a significant reduction in the Prevalence of Undernourishment (PoU), from a striking 46.4 per cent in 2001 to 30.1 per cent in 2021 (Figure 1), making it one of the best performers in hunger reduction in the world over that period, this progress has been fragile in many respects.[10] First, the level of the PoU remains very high with a third

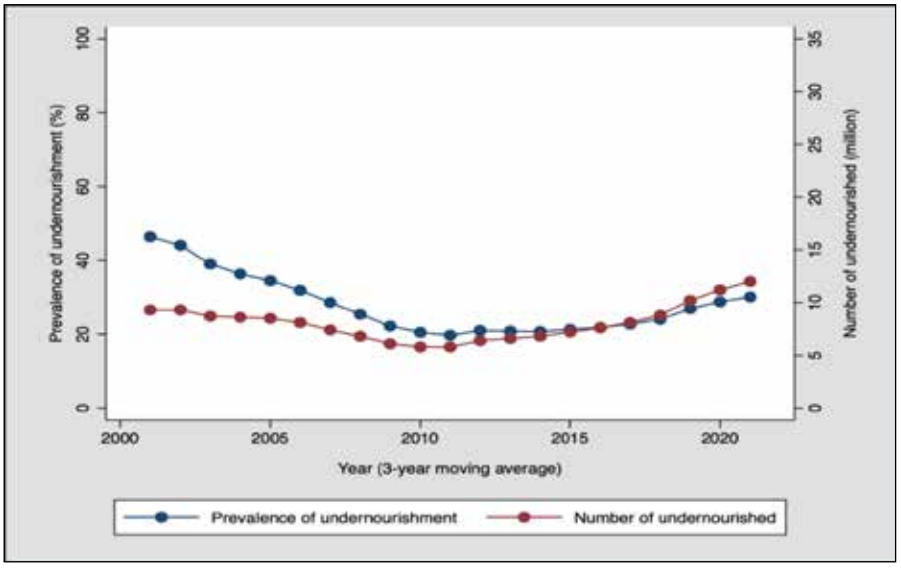
[8] Ibid.

[9] FSIN, "Global Report on Food Crises 2021", 2024, https://www.fsinplatform.org/report/global-report-food-crises-2024/.

[10] Center for Development Research, Food and Agriculture Organization of the United Nations, "Investment costs and policy action opportunities for reaching a world without hunger (SDG2)", Joint Report, 2020, https://openknowledge.fao.org/server/api/core/bitstreams/ca2f109d-31d0-46b7-99b5-f8d6cf668a7b/content.

of the Afghan population estimated to be undernourished. Second, despite significant hunger reduction in relative terms, the actual number of undernourished people has increased in absolute terms, from 9.3 million in 2001 to 12 million in 2021, due to high population growth. Third, the trajectory of hunger reduction was much faster until 2011, when the PoU reached its lowest level at 19.7 per cent, but the trend has since been reversed and much of the initial progress has been lost.

Figure 1: Prevalence of Undernourishment in Afghanistan (2001-2021)



Source: Authors' elaboration based on data from FAO (2024).

Alternative food security indicators provide similar insights regarding the worsening food security situation of the Afghan population. Considering the moderate and severe food insecurity measures based on the Food and Agriculture Organization of the United Nations (UN) Food Insecurity Experience Scale (Figure 2), it appears that as of 2021, the last year for which the official data is available, 79.1 per cent of the population, or 31.7 million people, experienced some form of food insecurity; and 28.4 per cent, or 11.4 million Afghans, experienced severe food insecurity. Looking at the Global Hunger Index, which is based on a combination of indicators including undernourishment, child stunting, wasting and mortality, Afghanistan currently ranks

Alternative food security indicators provide similar insights regarding the worsening food security situation of the Afghan population.

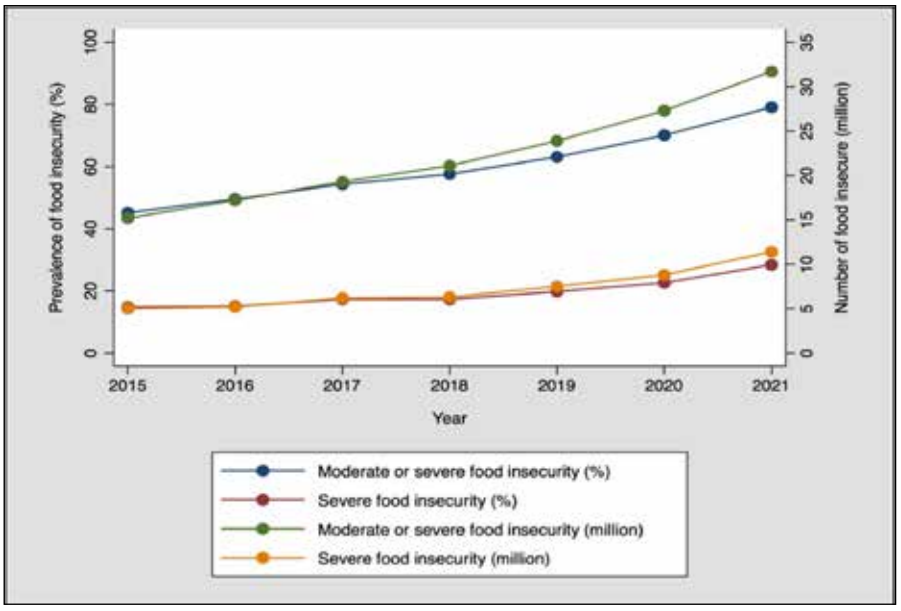
Overall, these figures indicate that Afghan households are vulnerable to political, economic and climatic shocks and lack resilience to these disruptions.

114 out of 125 countries for which data are available.[11] The latest Integrated Food Security Phase Classification (IPC) figures suggest that 29 per cent of the population, or 13.1 million people, were facing a high level of acute food insecurity (IPC Phase 3 or above) as of October 2023.[12] These figures were as high as 47 per cent in 2021 and 2022 mainly as a result of a collapsing economy combined with persistent drought. Overall, these figures indicate that Afghan households are vulnerable to political, economic and climatic shocks and lack resilience to these disruptions.

Two groups are particularly vulnerable to food insecurity: children and women. Around four million children and women in Afghanistan were suffering from acute malnutrition as of April 2023. Of those, almost a million children were affected by severe acute malnutrition.[13] Only 16 per cent of Afghan children consume a minimally acceptable diet, exacerbated by a high incidence of communicable diseases like diarrhoea, malaria and acute respiratory infection.[14] The stunting rate among children below five, at 41 per cent, is among the highest in the world.[15] Close to a million pregnant or lactating women are acutely malnourished.[16] Among adult women, 85.5 per cent experienced moderate or severe food insecurity as of 2021, and 33.3 per cent experienced severe food insecurity.[17] The prevalence of anaemia in women of reproductive age, a proxy of the nutritional status of women, has been increasing over the last two decades, despite the progress achieved in hunger reduction over that period.

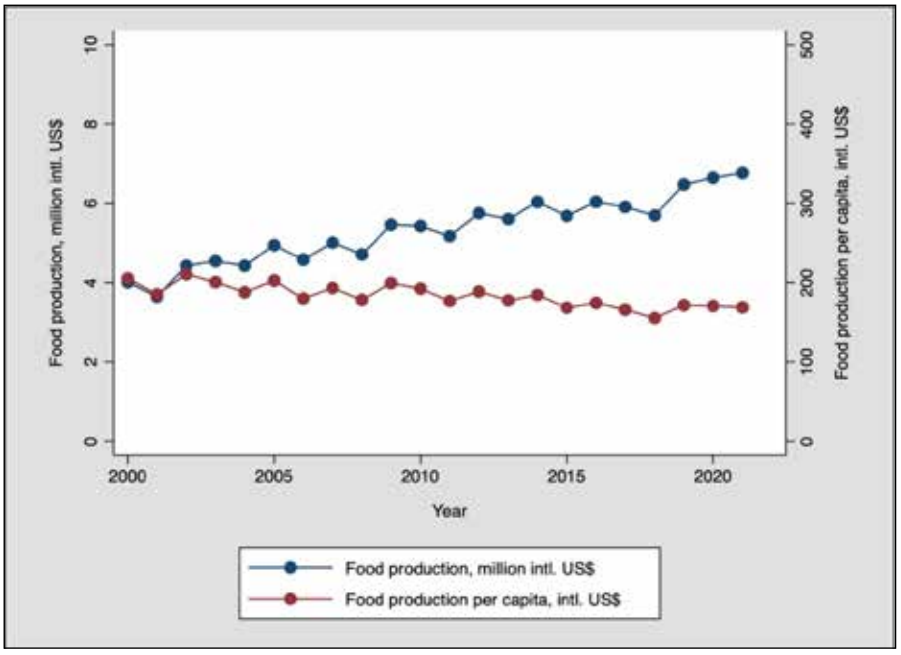
11 GHI, "Global Hunger Index: Afghanistan", 2024, https://www.globalhungerindex.org/afghanistan.html.
12 Integrated Food Security Phase Classification, "Afghanistan: Acute Food Insecurity Situation for October 2023 and Projection for November 2023-March 2024", 2023, https://www.ipcinfo.org/ipc-country-analysis/details-map/es/c/1156185/?iso3=AFG.
13 IPC, "Afghanistan: Acute Malnutrition Situation for September-October 2022 and Projection for November 2022-April 2023", 2023, https://www.ipcinfo.org/ipc-country-analysis/details-map/es/c/1156185/?iso3=AFG.
14 Ibid.
15 UNICEF, "Malnutrition: Afghanistan's silent emergency", 2024, https://www.unicef.org/afghanistan/nutrition.
16 IPC, "Afghanistan: Acute Malnutrition Situation for September-October 2022 and Projection for November 2022-April 2023", 2023, https://www.ipcinfo.org/ipc-country-analysis/details-map/es/c/1156185/?iso3=AFG.
17 FAO, "Suite of Food Security Indicators", 2024, https://www.fao.org/faostat/en/#data/FS.

Figure 2: Moderate and Severe Food Insecurity in Afghanistan (2015-2021)



Source: Authors' elaboration based on data from FAO (2024).

Figure 3: Food Production in Afghanistan



Source: Authors' elaboration based on data from FAO (2024).

Factors Contributing to Food Insecurity

A confluence of many factors and their interactions affect the Afghans' food security in all its four dimensions, that is, food availability, access, utilisation and stability. These dimensions crosscut across and engage with other domains, including conflict, political and macroeconomic instability, poverty and limited income-earning opportunities, forced displacement and humanitarian response efforts, climate change-induced floods and droughts, structural challenges, including an underperforming infrastructure, education and health system, and gender disparities. Decades of war and social upheaval have led to significant loss of life, human displacement, destruction of infrastructure and deterioration of the political, economic and social environment. Close to half of the Afghan population lived in poverty in 2020 – a figure disappointingly similar to that 20 years ago, just after the fall of the first Taliban regime at the end of 2001.[18] The gross domestic product (GDP) per capita has been declining over the last decade, with a significant drop in 2021. Over the last two years, real GDP contracted by a striking 26 per cent with implications in terms of purchasing power reduction, which limited households' capacity to access food, especially in the context of sustained high commodity prices.[19]

Furthermore, food production remains extremely vulnerable to climatic events such as floods and droughts.

Not only is access to food limited but food availability is also constrained, especially during certain seasons. Even though local food production has been rising on aggregate, it has been stagnating in per capita terms and not keeping pace with the growing population (Figure 3). Furthermore, food production remains extremely vulnerable to climatic events such as floods and droughts. The latter, in particular, have been persistent for three consecutive years following the worst drought in 30 years in 2021-2022.[20] According to the United Nations Office for the Coordination of Humanitarian Affairs, there has been a

18 Nasib Jan & Zaneta Kubik, "Multiple risks and poverty: evidence from Afghanistan", ZEF unpublished memo, 2021.
19 IPC, "Afghanistan: Acute Food Insecurity Situation for October 2023 and Projection for November 2023-March 2024", 2023, https://www.ipcinfo.org/ipc-country-analysis/details-map/es/c/1156185/?iso3=AFG.
20 United Nations Office for the Coordination of Humanitarian Affairs, "Afghanistan Humanitarian Needs and Response Plan 2024 (December 2023)", 2024, https://www.unocha.org/publications/report/afghanistan/afghanistan-humanitarian-needs-and-response-plan-2024-december-2023-endarips.

40-55 per cent deficit in the accumulated precipitation in the eastern and north-eastern regions, 25-40 per cent in western, northern and south-eastern areas, and 10-25 per cent in other parts of the country between October 2023 and January 2024, compared to the historical average.[21] Wheat, the main crop grown all over Afghanistan, has been significantly affected by the deficit in precipitation. On top of that, a flash flood in north-eastern Afghanistan affected around 60,000 people, resulting in the loss of 347 human lives, 14,000 livestock and the destruction of approximately 24,000 hectares of agricultural land, which is a grave concern for food security.[22]

Another major reason for high food insecurity in Afghanistan is political instability and ongoing conflicts. According to the World Food Programme, since the de facto regime took control of Kabul, joblessness, lack of money and rising prices have exacerbated hunger.[23] An estimated 15.8 million Afghans do not have enough food to consume, and 25 of the 34 provinces experience acute malnutrition above emergency thresholds.[24]

Economic poverty and financial crises are other major contributors to food insecurity in Afghanistan. A total of 900,000 people lost their jobs or were expelled from their positions within the first year of the Taliban coming to power.[25] Furthermore, the outbreak of COVID-19 further exacerbated food insecurity in Afghanistan. According to estimates from the International Labour Organization, the consequences of mobility restrictions due to COVID-19 caused a considerable decrease in daily wages and small traders' incomes.[26]

A total of 900,000 people lost their jobs or were expelled from their positions within the first year of the Taliban coming to power.

21 United Nations Office for the Coordination of Humanitarian Affairs, "Afghanistan: Slow-Onset Early Action Plan for Drought-Drought Preparedness, May 2024", 2024, https://www.unocha.org/publications/report/afghanistan/afghanistan-slow-onset-early-action-plan-drought-drought-preparedness-may-2024.

22 UNOCHA, "Afghanistan Floods: Flash Update #3 - Floods hit the Northeastern Region of Afghanistan", 2024, https://www.unocha.org/publications/report/afghanistan/afghanistan-floods-flash-update-3-floods-hit-northeastern-region-afghanistan-22-may-2024.

23 World Food Programme, "Emergency: Afghanistan", 2024.

24 "Afghanistan Humanitarian Needs and Response Plan 2024 Summary", United Nations Office for the Coordination of Humanitarian Affairs, 2024, https://www.unocha.org/publications/report/afghanistan/afghanistan-humanitarian-needs-and-response-plan-2024-summary.

25 International Labour Organisation, "ILO estimates underscore Afghanistan employment crisis", 2022 https://www.ilo.org/resource/news/ilo-estimates-underscore-afghanistan-employment-crisis.

26 World Food Programme, "Afghanistan: IPC Acute Food Insecurity Analysis (August 2020 - March 2021)", 2022, https://www.fsinplatform.org/sites/default/files/resources/files/IPC_Afghanistan_AcuteFoodInsec_2020Aug2021March_report.pdf.

Another factor contributing to food insecurity in Afghanistan is gender disparities. Almost all the female-headed households in Afghanistan do not have enough food to put on the table.[27]

Strategies to Address Food Insecurity

To address food insecurity, there is a dire need to develop national-level strategies involving major international donor agencies and the UN.

Since August 2021, with the arrival of the de facto regime in Kabul, most developmental aid to Afghanistan has been restricted with a shift towards providing emergency relief to the Afghan population. This does not solve the key issue of food insecurity. To address food insecurity, there is a dire need to develop national-level strategies involving major international donor agencies and the UN. However, these efforts have been hampered by the de facto regime's persistent violation of basic human rights in Afghanistan. If the de facto regime's stance does not change and the international community refuses to get the de facto regime involved, alternative options must be sought out. While addressing acute food insecurity through emergency assistance is vital, long-term solutions such as sustainable agriculture practices must also be prioritised to enhance food production and resilience against climate impacts.

There is a need to consider sustainable strategies for encouraging sustainable agricultural practices to enhance food production and mitigate food insecurity. Since climate change and consequent floods and droughts have strongly hit agricultural lands, farmers need to be supported by providing improved seed varieties that are not only drought-resistant but also suitable for local climatic conditions. In addition, the provision of fertiliser and micro-loans may also assist farmers to grow more and increase their productivity. Furthermore, strengthening community or kitchen gardening may also help, particularly among female-headed families who could partially grow their food on a small scale.

[27] United Nations, "Afghanistan: Food insecurity and malnutrition threaten 'an entire generation'", 2022, https://news.un.org/en/story/2022/03/1113982.

Efforts should be made to connect Afghan farmers with the local markets and facilitate exports of their surplus produce, mostly dry fruits, to neighbouring countries. This will not only help the farmers generate income but also create jobs for the local labour force.

This will not only help the farmers generate income but also create jobs for the local labour force.

Rural communities have been engaged in rearing poultry and livestock. Extending their support to enable backyard poultry farming, livestock rearing and honey beekeeping can aid in addressing the issue of food insecurity at local levels.

Afghan farmers also lack cold storage facilities, often forcing them to sell their produce at minimal prices. By supporting the development of adequate storage infrastructure surplus agricultural produce could be preserved for use during periods of high demand, thereby helping farmers earn better incomes and hence alleviate food insecurity.

Food Security in Bangladesh: Challenges and the Way Forward

Fahmida Khatun

Introduction

Enabling agricultural policies such as incentives to farmers, trade policy reforms for importing fertiliser and irrigation equipment, and a rise in private and public investment in agriculture have also contributed to the growth of the agriculture sector.

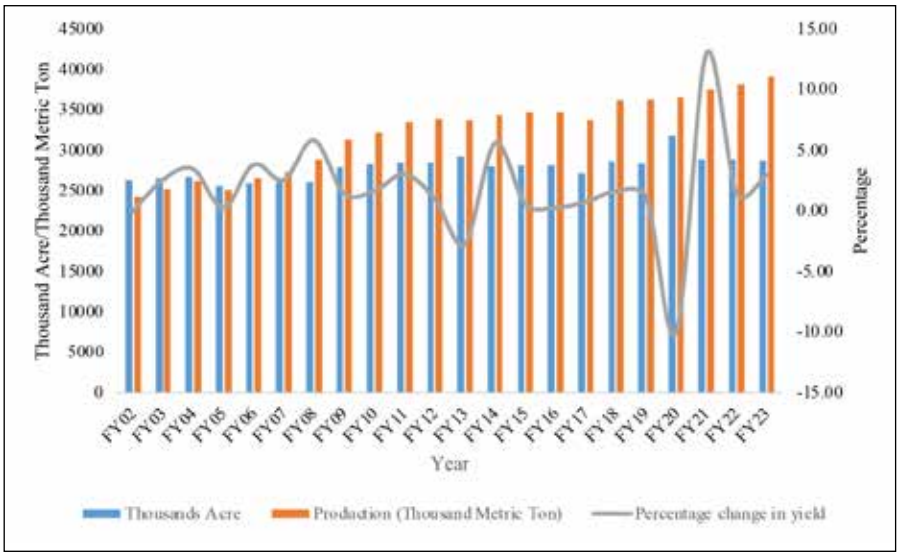
Bangladesh has achieved self-sufficiency in food production because of its good agricultural performance over the years. This has been due to the technological innovations of the 1970s when high-yielding varieties of seeds were developed and adopted. In addition, there was expansion and better management of irrigation, and effective delivery of seeds and fertilisers. All these contributed to increasing agricultural production, mainly rice production.[1] The trend of rice production in Bangladesh during 2002-2023 is shown in Figure 1. Enabling agricultural policies such as incentives to farmers, trade policy reforms for importing fertiliser and irrigation equipment, and a rise in private and public investment in agriculture have also contributed to the growth of the agriculture sector.

Along with higher food production, the development of the food processing sector has created employment opportunities and improved Bangladeshi people's capacity to access food. This is evident in the rise in Bangladesh's average per capita daily food intake, which increased from 893.1 grammes in 2000 to 1,129.8 grammes in 2022. Commensurately, the average daily per capita calorie intake also increased from 2,240.3 kilo calories in 2000 to 2,393 kilo calories in 2022 (Figure 2).[2]

1 Mahabub Hossain, "Four Decades of Agricultural Development in Bangladesh", in Bayes, A (ed). *Bangladesh at 40: Changes and Challenges*, A H Publishing House, 2012.

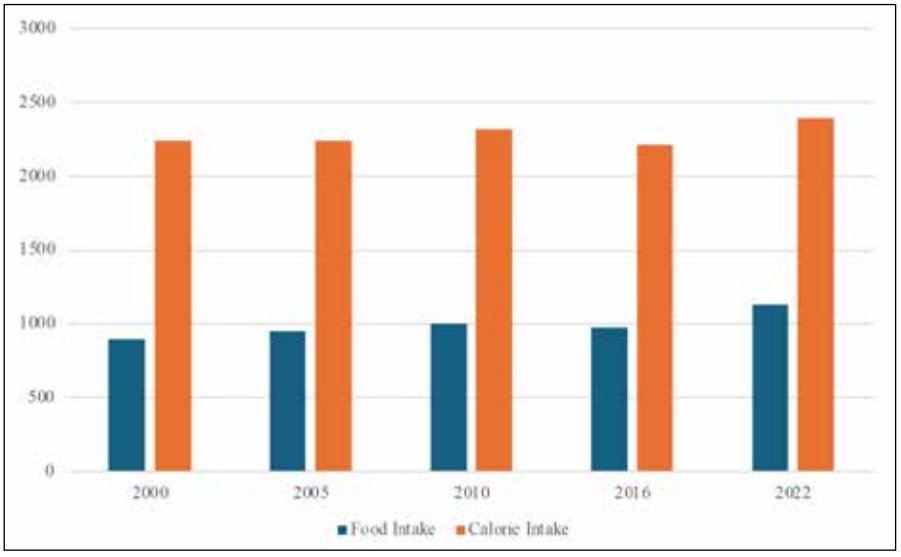
2 "Household Income and Expenditure Survey 2022", Bangladesh Bureau of Statistics, 2022.

Figure 1: Total Rice Production (Thousands Acre, Thousands Metric Tonnes)



Source: Bangladesh Economic Review (2024).

Figure 2: Average Daily Per Capita Food and Calorie Intake



Source: Household Income and Expenditure Survey (2022).

It is crucial to understand that food self-sufficiency, while a significant achievement, is not synonymous with food security. The latter is a complex, multidimensional issue that goes beyond mere availability. As per the Food and Agriculture Organization of the United Nations, food security is a situation "when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life."[3] This comprehensive definition covers four key dimensions of food security: food availability, access, utilisation and stability. The multidimensional nature of food security underscores the need for a comprehensive approach to ensure the well-being of Bangladesh's population.

Among the five South Asian countries covered in the report, namely, Bangladesh, India, Nepal, Pakistan and Sri Lanka, Bangladesh lagged all South Asian countries except Pakistan.

When considering these aspects, Bangladesh falls behind in the Global Food Security Index (GFSI) despite achieving higher food production. The GFSI is constructed based on four factors: food affordability, availability, quality and safety, and sustainability and adaptability.[4] Bangladesh was ranked 80th among 113 countries considered in the GFSI report in 2022. Among the five South Asian countries covered in the report, namely, Bangladesh, India, Nepal, Pakistan and Sri Lanka, Bangladesh lagged all South Asian countries except Pakistan.

The share of the Bangladeshi population falling in the category of either moderately or severely food insecure has reduced marginally from 32.2 per cent in 2015 to 31.1 per cent in 2021. Also, the share of people suffering from severe food insecurity declined from 13.3 per cent in 2015 to 11 per cent in 2021.[5] A moderate level of food insecurity is a situation when people do not have the ability to eat healthy and balanced diets regularly, while severe levels of food insecurity indicate a high probability of less food intake, due to which people may suffer more severe forms of undernutrition, including

3 FAO, IFAD, UNICEF, WFP and WHO, "The State of Food Security and Nutrition in the World 2024 – Financing to end hunger, food insecurity and malnutrition in all its forms", 2024.

4 "Global Food Security Index", *The Economist*, 2022, https://impact.economist.com/sustainability/project/food-security-index/reports/Economist_Impact_GFSI_2022_Global_Report_Sep_2022.pdf.

5 "Data Bank", The World Bank, https://databank.worldbank.org/source/sustainable-development-goals-(sdgs)/Series/SN.ITK.MSFI.ZS.

hunger.[6] Access to a healthy diet is also a challenge for many people. The proportion of the population unable to afford a healthy diet reduced from 65 per cent in 2017 to 48.2 per cent in 2022 but it is still high.[7]

Challenges to Food Security in Bangladesh

A few of the key drivers that impede adequate access to food in Bangladesh include high inflationary pressure, coupled with macroeconomic shocks, market manipulation by cartels and adverse effects of climate change. Following the COVID-19 pandemic and the Ukraine war, inflationary pressures escalated worldwide, including in Bangladesh. However, inflationary pressure due to higher prices continues to be persistent in Bangladesh despite a fall in global prices. In June 2024, the general point-to-point inflation was 9.72 per cent compared to 5.64 per cent in June 2021. More worrying, food inflation was higher at 10.42 per cent in June 2024, compared to 6.04 per cent in June 2021.[8] According to a recent survey conducted by the World Food Programme (WFP) in January 2024, high food prices remain a major concern among households in Bangladesh.[9] The ongoing inflation has squeezed the purchasing power of low-income people as their wages have not increased. The minimum wage in most of the sectors in Bangladesh is not enough to support basic family expenses.[10]

The minimum wage in most of the sectors in Bangladesh is not enough to support basic family expenses.

Second, Bangladesh's economy is currently confronted with several challenges such as the slowdown in economic growth and the risks emanating from its high external debt. These factors, along with persistent inflation, have weakened the macroeconomic stability of the country.[11] Additionally, the economy has not been able to

6 FAO, IFAD, UNICEF, WFP and WHO, "The State of Food Security and Nutrition in the World 2024 – Financing to end hunger, food insecurity and malnutrition in all its forms", 2024.
7 Ibid.
8 Bangladesh Bureau of Statistics, "Consumer Price Index (CPI) and Inflation Rate", 2024, https://bbs.portal.gov.bd/sites/default/files/files/bbs.portal.gov.bd/page/9ead9eb1_91ac_4998_a1a3_a5caf4ddc4c6/2024-07-07-07-34-c04c1dba29f6069804eb8c2f1df73451.pdf.
9 World Food Programme, "Bangladesh Food Security and Vulnerability Monitoring (mVAM) January 2024", *Remote Household Food Security Survey Brief*, January 2024.
10 Centre for Policy Dialogue, "State of the Bangladesh Economy in FY2023-24, Third Reading", Centre for Policy Dialogue, June 2024.
11 Ibid.

create enough employment for the country's young population. Although the average unemployment rate is only 3.53 per cent, youth unemployment is eight per cent.[12] Even worse, 40.67 per cent of the youth aged between 15 and 24 years are not in employment, education and training.[13] As a result of a large number of people not engaged in income-generating activities, their access to food has been limited. Hence, a large section of the Bangladeshi people has been facing difficulties in meeting their daily dietary requirements. It was found that in the recent period, an average of 31 per cent of the people in eight divisions of Bangladesh have had insufficient diet.[14]

The survey report refers to several factors behind this disparity, such as lower income opportunities, fewer skills, higher family responsibility and safety concerns among women.

The effects of increased expenditures from rising prices have varied impacts across and within different regions and groups of people. According to a recent survey, while individuals from a low-income group particularly experienced a greater loss in earnings, households in the Barishal, Chattogram and Dhaka divisions of Bangladesh reported higher average income losses, ranging from 20 to 50 per cent.[15] Among the female-headed households, 36 per cent have been found to be facing food insecurity, compared to 16 per cent among the male-headed households. The survey report refers to several factors behind this disparity, such as lower income opportunities, fewer skills, higher family responsibility and safety concerns among women.

Third, when international prices are high, import costs are also high, which has an impact on domestic prices. In Bangladesh, domestic factors, particularly cartels and collusions, also play a significant role in raising domestic prices.

Usually, essential commodities are regarded as homogenous items. Theoretically, producers of such commodities have limited capability in influencing the market prices of their products. In Bangladesh,

12 Bangladesh Bureau of Statistics, "Labour Force Survey (LFS) 2022", 2023.
13 Bangladesh Bureau of Statistics, "Bangladesh Sample Vital Statistics 2022 of the Bangladesh Bureau of Statistics", December 2023.
14 World Food Programme, "Bangladesh Food Security Monitoring", Remote Household Food Security Survey Brief, January 2024, https://docs.wfp.org/api/documents/WFP-0000156603/download/? ga=2.78578388.1146349533.1722323549-1734710818.1721900210.
15 Ibid.

however, the domestic market and its distribution systems are quite intricate.[16] Due to various intermediaries, there is a lack of a substantial number of wholesalers for several locally manufactured products despite having numerous retailers. In this context, concerns about cartels, sabotage and hoarding have occasionally been raised although such allegations are often challenging to substantiate.[17]

The market for essential goods is observed to have an acute concentration of market power, predominantly held by a small number of firms. Consequently, anti-competitive behaviour is rampant, including price manipulation, control over market supply and deliberate creation of scarcity through hoarding. Such practices are executed through adequately managed cartels or implicit agreements.[18]

Fourth, inadequate access to food and food insecurity in Bangladesh are also due to the impact of climate change on agriculture. The geographical location, topography and climate of Bangladesh make it a disaster-prone country, which is highly susceptible to climate change. Consequently, households' access to food could decline further due to climate shocks, rendering the most food-insecure populations exceedingly vulnerable.

Bangladesh regularly suffers from extreme climate events such as floods, droughts, cyclones, salinity and sea-level rise. The frequency and intensity of these natural occurrences are escalating and threatening household cereal food consumption.[19] This is because extreme natural disasters hinder agricultural production. Cyclones and intrusion of saline water from tidal surges damage crops incurring losses for the producers. Shortages in the domestic supply chain due to inadequate production of crops and cereals influence prices in the retail market in an upward direction. This limits food consumption by individuals, especially the poor, due to a lack of affordability. Floods

The frequency and intensity of these natural occurrences are escalating and threatening household cereal food consumption.

16 Centre for Policy Dialogue, "State of the Bangladesh Economy in FY2023-24, First Reading", 2023.
17 Ibid.
18 Ibid.
19 Mohammad Saiful Islam, et al, "Climate change, climatic extremes, and households' food consumption in Bangladesh: A longitudinal data analysis", Environmental Challenges, 2022.

also destroy agricultural production, depending on their frequency, magnitude and timing. Climate change also affects the temperature in Bangladesh, causing extreme heat for a prolonged period with potential risks for crop yields.[20]

Recommendations

To overcome the challenges to food security in Bangladesh, there is a need for the government to undertake certain reforms. Some of these are discussed below.

Adopting and Implementing Robust Social Protection Measures

For the low and middle-income groups, higher volume and more types of essential commodities should be sold at an affordable price through open market sales.

Ensuring the food security of vulnerable populations in the face of high inflationary pressures requires the adoption and implementation of robust social safety net measures for poor and low-income families. The allocation for food support under the social protection programmes should be increased. Implementing social safety net programmes such as direct cash transfers and improving access to affordable essential goods for those in poverty and low-income brackets is useful for giving short-term support and protection to these vulnerable populations. However, these programmes must be well targeted and properly managed to prevent waste and corruption. For the low and middle-income groups, higher volume and more types of essential commodities should be sold at an affordable price through open market sales.

Ensuring an Adequate Supply of Food

Another urgent requirement is to increase domestic production and import of necessary food items to ensure an adequate food supply in the market. Additionally, market distortions must be addressed through strict market monitoring. Anti-competitive practices in food

20 L O'Leary, S Dasgupta and E J Robinson, "Impacts of climate change on health in Bangladesh", Policy Brief, London School of Economics and Political Science (LSE), 2023 https://www.lse.ac.uk/granthaminstitute/wp-content/uploads/2023/10/Impacts-of-climate-change-on-health-in-Bangladesh-Policy-brief.pdf.

markets must be effectively addressed through effective enforcement of laws and regulations to prevent unfair practices.

Increasing Investment for Higher Agricultural Production through Research and Innovation

Since land is static and population is not, food production must be increased through various methods, such as quality seeds, the use of balanced fertilisers and water management. More research should be carried out to enhance production and increase the variety of rice. The government should invest more in sustainable agricultural practices to enhance productivity and diversify crops, especially keeping in mind the threat of climate change.

More research should be carried out to enhance production and increase the variety of rice.

Increasing Investment in the Agriculture Sector

More resources are needed not only for frontier technology to increase productivity but also for enhanced storage facilities to preserve harvest and reduce losses. The development and improvement of the supply chain infrastructure is crucial for the efficient distribution of food. Therefore, the government should invest more resources towards this.

Improving the Purchasing Power of People

Finally, enhancing the purchasing power of people is crucial. Food security is not only about food availability but also about affordability. Even if there is ample food in the market, people cannot have it without money. Therefore, there should be opportunities for decent employment for the unemployed.

Bhutan's Agriculture and Food Security: Opportunities and Challenges

Dil B Rahut, Chandra Shekhar Dhakal and Raja Rajendra Timilsina

Introduction

Bhutan has ensured its food security and contributed to broader environmental sustainability goals by integrating agriculture, livestock and environmental conservation.

The latest Global Report on Food Crises has highlighted the increasing global food insecurity, with nearly 282 million people across 59 nations and territories affected by acute hunger in 2023.[1] This emphasises the urgent need for scholarly discussion and practical interventions to address this growing crisis. Bhutan's agricultural practices have been recognised as a global example of harmonising human activity with nature in light of the increasing global food insecurity.[2] Amidst concerns about global food availability, Bhutan's agricultural model stands out.[3] Bhutan has ensured its food security and contributed to broader environmental sustainability goals by integrating agriculture, livestock and environmental conservation.[4]

Bhutan's agricultural journey, evolving from nomadic farming to a modern and productive farming system, has positively impacted incomes, livelihoods, health, education and the economy.[5] The Bhutanese term for agriculture, *Soenam*, meaning merit or blessing, reflects the deep reverence for farming in the country. In the face of environmental degradation, climate change and food insecurity,

1 Food Security Information Network (FSIN), "Global Report on Food Crises 2024", 2024, https://www.fsinplatform.org/report/global-report-food-crises-2024/; and Junaid Ashraf and Aiman Jave, "Food security and environmental degradation: Do institutional quality and human capital make a difference?", *Journal of Environmental Management*, 331, 2023, https://doi.org/10.1016/j.jenvman.2023.117330.

2 John W Mellor, "Global food balances and food security", World Development, 16, 997-1011, 1988 https://doi.org/10.1016/0305-750X(88)90104-0..

3 Marc F Bellemare, "Rising Food Prices, Food Price Volatility, and Social Unrest", *American Journal of Agricultural Economics*, 97, 1–21, 2015, https://doi.org/10.1093/ajae/aau038; IFPRI, "Who's Afraid of High Fertilizer Prices?" IFPRI Blog, 2022 https://www.ifpri.org/blog/whos-afraid-high-fertilizer-prices.

4 Jigme Singye Wangchuck, "The history of the introduction and adoption of important food crops in Bhutan", 2015; T Y Dorji, A M Tamang and R Vernooy, "The history of the introduction and adoption of important food crops in Bhutan. Rice, maize, potato and chili", 2015; John W McArthur and Gordon C McCord, "Fertilizing growth: Agricultural inputs and their effects in economic development", *Journal of Development Economics*, 127, 133–152, 2017, https://doi.org/10.1016/j.jdeveco.2017.02.007; and Nitya Rao, "The achievement of food and nutrition security in South Asia is deeply gendered", Nature Food, 2020, https://doi.org/10.1038/s43016-020-0059-0.

5 "Asian Development Bank and Bhutan: Fact Sheet", Asian Development Bank, 2023, https://www.adb.org/publications/bhutan-fact-sheet.

Bhutan's agricultural practices demonstrate the potential for holistic approaches to mitigate these challenges and foster resilience in food systems worldwide.[6]

The analysis presented in this paper is crucial in understanding Bhutan's successful agricultural model, providing key trends in agriculture sectors, outlining policy and strategy initiatives, examining major challenges and proposing policy recommendations essential for ensuring sustainable economic growth and food security.

The significance of agricultural land is paramount in this context. The legal framework governing agricultural land in Bhutan dates to 1953.[7] This framework, including the Land Acts of 1978 and 2007 and the Forest Act of 1969, shapes land use and ownership to prioritise sustainable practices and food self-sufficiency.[8] Particularly, the Land Act of 2007 mandates the registration and certification of agricultural land with strict regulations on agrarian land conversion to other uses. Government-leased land for commercial agriculture cannot be transferred or traded. This aligns with Bhutan's constitution which emphasises state ownership and regulation of natural resources. Bhutan's constitution also restricts land sales to non-citizens. Land reform initiatives, such as providing land to the landless and imposing landholding caps, demonstrate a commitment to societal welfare.[9] Overall, land legislation is second only to Bhutan's constitution, reflecting the nation's deep connection to land, livelihood and well-being.

Land reform initiatives, such as providing land to the landless and imposing landholding caps, demonstrate a commitment to societal welfare.

6 Ugyen Penjor, Sonam Wangdi, Tandin Tandin, and David W. Macdonald, "Vulnerability of mammal communities to the combined impacts of anthropic land-use and climate change in the Himalayan conservation landscape of Bhutan", *Ecological Indicators*, 121, 2021, https://www.sciencedirect.com/science/article/pii/S1470160X20310244.

7 Kinzang Dorji, "Comprehensive review of the land act of Bhutan, 2007 for revision", The Centre for Bhutan Studies & GNH Research, 2014.

8 Jigme Singye Wangchuck, "The history of the introduction and adoption of important food crops in Bhutan", 2015; and T Y Dorji, et al, "The history of the introduction and adoption of important food crops in Bhutan. Rice, maize, potato and chili", 2015.

9 Royal Government of Bhutan, "The Constitution of the Kingdom of Bhutan", 2008.

Agriculture Policies and Legal Framework

Bhutan's economy remains largely agrarian, with farmers practising subsistence agriculture on small landholdings, averaging 3.7 acres per household and using traditional labour exchange methods. Agriculture plays a crucial role in driving the nation's economy, food supply and gross domestic product (GDP) growth. The renewable natural resources (RNR) sector, encompassing agriculture, livestock and forestry, has made significant progress toward achieving food self-sufficiency through various policy interventions. Bhutan has implemented farmer-friendly policies to enhance food and nutrition security, strengthen the agricultural sector and promote biodiversity conservation. The National Forest Policy of 2011 and the National Food and Nutrition Security Policy of 2014 serve as the primary policies guiding the RNR sector in its core mandates of sustainable natural resource management and food self-reliance.[10] Additionally, numerous contributory public policies and legislation are in place to support the sector's operations.

These policies collectively aim to enhance food security, manage natural resources sustainably, protect biodiversity and improve the agricultural sector's productivity and resilience.

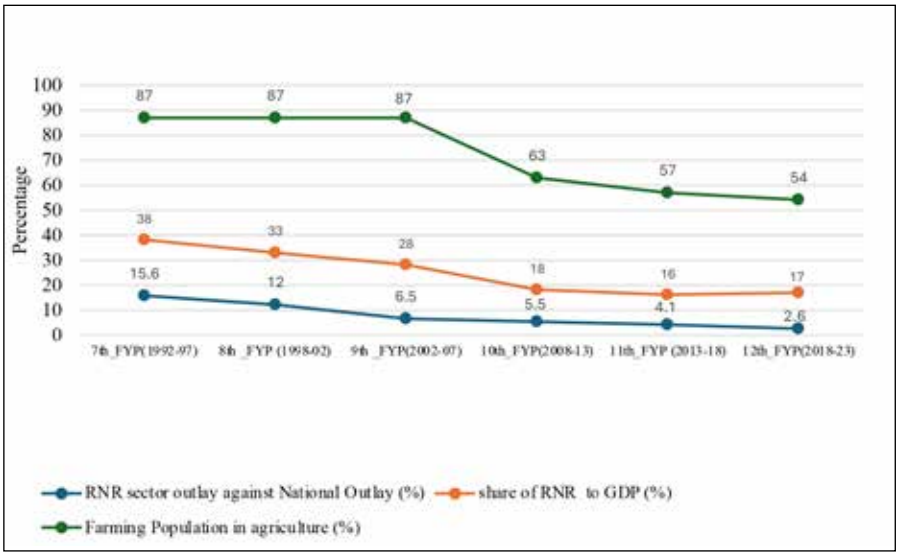
The key policies and legal frameworks that have shaped Bhutan's agricultural sector are outlined in Table 1 (Appendix). These policies span from the National Irrigation Policy of 1992, aimed at developing irrigation systems, to the Biodiversity Rules and Regulations of 2023, which implement the Biodiversity Act of 2022. Key policies include the National Forest Policy of 2011, focusing on sustainable forest management, and the Food and Nutrition Security Policy of 2014 and 2023, which emphasise food security and nutrition. These policies collectively aim to enhance food security, manage natural resources sustainably, protect biodiversity and improve the agricultural sector's productivity and resilience.

The significant acts and strategies implemented to support Bhutan's agriculture and natural resources management from 1969 to 2022 are presented at Table 2 (Appendix). The Forest Act of 1969 established forest reserves while the Plant Quarantine Act of 1993 aimed to

10 "RNR Strategy 2040", Royal Government of Bhutan, Ministry of Agriculture and Livestock, 2021.

control pests. The Food Act of Bhutan 2005 focused on regulating food trade and protecting human health. Recent strategies like the RNR Strategy 2040 outline plans for sustainable access to food and resources by 2040. These acts and strategies have been pivotal in promoting sustainable agricultural practices, protecting natural resources and ensuring food security in Bhutan.

Figure 1: Agriculture Sector, GDP Contribution and Farming Population (7th-12th Five Year Plans)



Source: MoF, Annual Financial Statements, MoAL, RNR strategy 2040.

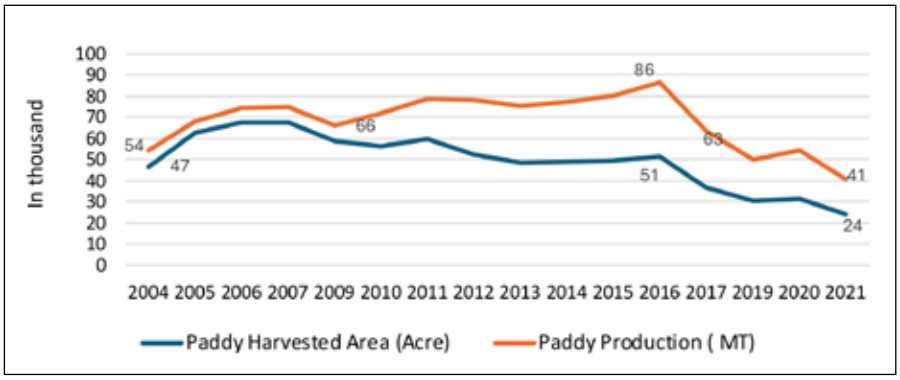
The agriculture sector in Bhutan shows a declining trend across successive planning periods. Over the past three decades, three key parameters in agriculture have declined: public investment in the RNR sector, the farming population and the share of RNR in GDP (Figure 1). Public sector investment is vital for agricultural growth, but it has declined despite 64 per cent of the rural population depending on agriculture for their livelihood.[11] The contribution of the sector to the GDP has decreased despite being the biggest employer in the country, indicating a decline in productivity. At the same time, the migration of people from rural to urban areas and the shrinking

The agriculture sector in Bhutan shows a declining trend across successive planning periods.

11 NSB, "Agriculture Statistics Report, 2021", National Statistics Bureau, Thimphu, Bhutan, 2021.

farming population has caused 26 per cent of farmland in Bhutan to be left fallow, primarily due to labour shortages.[12] These trends concern Bhutan's agrarian economy, affecting all aspects of food security: crop yield, prices, food vulnerability and household vulnerability.[13]

Figure 2: Paddy Harvested Area (Acres) and Quantity Produced (MT)



Source: Agriculture Statistics Reports, RNR Census Report and authors' computations.

This decline is attributed to urbanisation, rapid socioeconomic development and a shift towards more economically profitable crops that require less labour and fewer resources.

Achieving rice self-sufficiency, a top priority of the agricultural policy agenda continues to be a major goal for Bhutan. However, paddy-harvested areas are shrinking, and production is declining despite government efforts to enhance paddy cultivation and revitalise irrigated land (Figure 2). The harvested area fell from around 47,000 acres in 2004 to approximately 24,000 acres in 2021. During the same period, production decreased from 54,000 metric tonnes (MT) to 42,000 MT.[14] This decline is attributed to urbanisation, rapid socioeconomic development and a shift towards more economically profitable crops that require less labour and fewer resources. Urbanisation and economic development have further reduced prime paddy wetlands, leading agricultural holders to pursue other economic activities beyond agriculture. Additionally, competition from vegetables and cash crops has reduced paddy acreage. The

12 "RNR Sector Annual Progress Report – June 2021-June 2022", Ministry of Agriculture and Forest, Royal Government of Bhutan, 2022.
13 National Statistics Bureau, "Statistical Yearbook of Bhutan 2022", 2022, https://www.nsb.gov.bt/.
14 NSB, "Agriculture Statistics Report, 2021", National Statistics Bureau, Thimphu, Bhutan, 2021.

number of irrigated paddy growers dropped significantly from 28,516 in 2020 to 25,336 in 2021, an 11 per cent decrease within a year.[15]

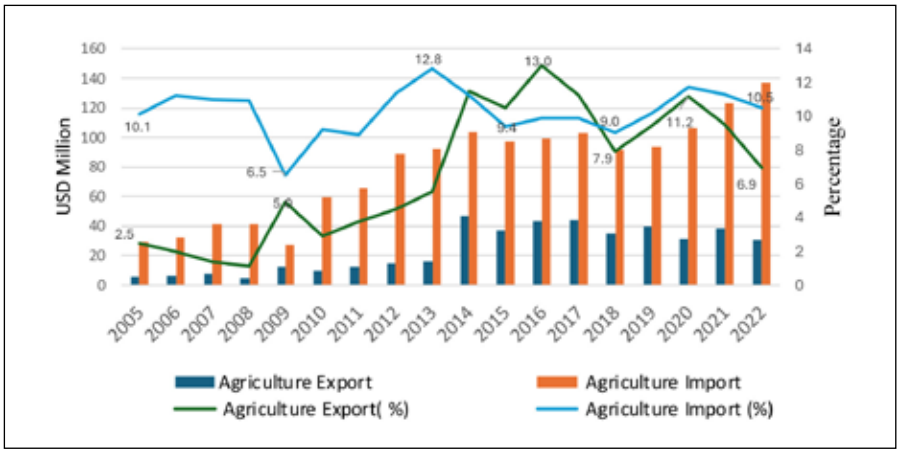
Modernising Bhutan's Agriculture: From Self-sufficiency to Global Markets

Bhutan's agricultural development entered a modern phase with the country's first Five Year Plan (FYP) from 1961 to 1966, focusing on organised agriculture and husbandry.[16] The 1960s green revolution facilitated access to high-yielding crop varieties and production technologies. Initiatives like model farms, research stations and extension services were implemented to enhance food security and domestic production. By 1992, cereal self-sufficiency reached 66 per cent, particularly in maize, barley, millet and buckwheat.[17] Subsequent plans targeted rice self-sufficiency and introduced various cereal varieties to support food security. Bhutan achieved self-sufficiency in fruits (132 per cent), potatoes (162 per cent) and eggs (100 per cent) by 2016, with progress in other commodities.[18] The 12th FYP (2018-2023) emphasised food self-sufficiency and natural resource management. The COVID-19 pandemic eroded hard-won progress and exposed vulnerabilities in the agriculture sector leading to a revised Food and Nutrition Security (FNS) policy in 2023.[19] The 13th FYP (2024-2029) aims to promote large-scale commercial farming, support subsistence farming, develop high-value export products, enhance agricultural ecosystem services for sustainable biodiversity, improve governance and strengthen the business system to encourage private sector involvement.[20]

The 1960s green revolution facilitated access to high-yielding crop varieties and production technologies.

15 Data source: Agriculture Statistics reports from 2004 to 2021, NSB, Thimphu, Bhutan.
16 Jigme Singye Wangchuck, "The history of the introduction and adoption of important food crops in Bhutan", 2015.
17 T Y Dorji, et al, "The history of the introduction and adoption of important food crops in Bhutan. Rice, maize, potato and chili", 2015.
18 "RNR Strategy 2040", Royal Government OF Bhutan, Ministry of Agriculture and Livestock, Thimphu, Bhutan, 2021.
19 "Twelfth Five Year Plan, 2018-2023", Ministry of Agriculture and Forests, Royal Government of Bhutan, 2019.
20 Ministry of Agriculture and livestock, Royal Government of Bhutan, https://www.moal.gov.bt/.

Figure 3: Export and Import of Agriculture Products (2005-2022), US$ Million

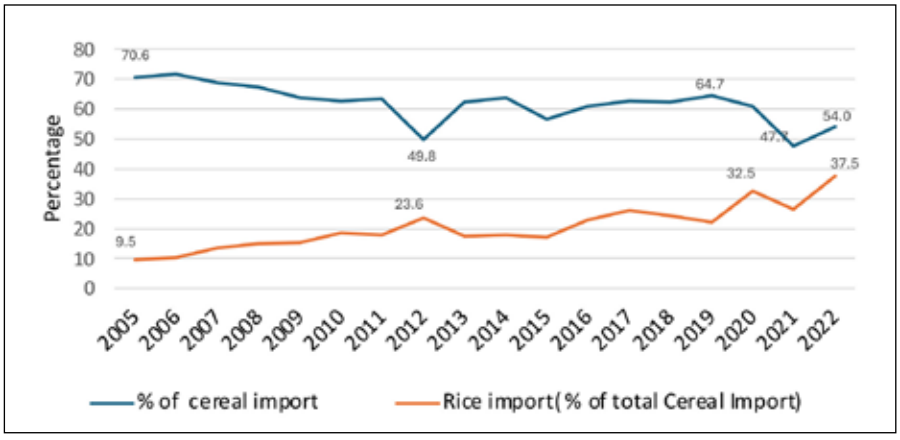


Source: Agriculture Statistics Reports and author's computations.

The growth in imports has been faster than the growth in exports in absolute terms.

The import and export of agricultural products in Bhutan have both increased over the years (Figure 3). The growth in imports has been faster than the growth in exports in absolute terms. Although the share of agricultural imports in the total import value has remained around 10 per cent, the share of exports has increased, indicating the success of agricultural exports. Bhutanese agricultural products have experienced growing demand overseas due to their natural cultivation in a clean environment. This demand is expected to continue growing as consumers become more health-conscious and aware of food safety.

Figure 4: Per cent of Cereal and Rice Import



Source: Agriculture Statistics Reports and author's computations.

Although most farmers in Bhutan cultivate paddy, the country is increasingly dependent on rice imports (Figure 4), which raises serious food security concerns. While 60 per cent of the population is engaged in food production, the country currently imports almost 50 per cent of its food requirements.[21] By 2034, agriculture sectors will need to feed approximately 837,288 people, necessitating increased production to meet growing food demands and ensure population health.[22] Rice is a staple food in Bhutan and holds great importance in the country's diet, culture, tradition, religion and livelihood. However, domestic rice production has yet to meet the demand, leading to a growing reliance on imports to bridge the gap. This reliance poses a significant threat to Bhutan's food security in the medium and long term. However, with proper utilisation of land and production resources, Bhutan has the potential to emerge as an agricultural powerhouse in the region without causing harm to the natural environment.[23]

Rice is a staple food in Bhutan and holds great importance in the country's diet, culture, tradition, religion and livelihood.

Challenges in the Agriculture Sector

The government has made efforts and achieved significant progress, but Bhutan is still facing challenges related to food insecurity. These challenges include a lack of adequate arable land, low productivity, demographic changes, labour shortages,[24] land fragmentation, feminisation of agriculture, ageing farming population, limited capacity to adopt advanced farming techniques, high post-harvest losses, insufficient irrigation facilities (only 48.1 per cent of farming households irrigate their farmland, with almost 89 per cent using surface irrigation systems), increasing fallow land and climate change-induced shifts in monsoon patterns. Some of these challenges are discussed in the next few pages.

21 "Building a resilience food system in Bhutan", World Food Programme, Thimphu, Bhutan, 2022.
22 Ministry of Agriculture and Livestock, "RNR Annual Report 2021-2022", Ministry of Agriculture and Livestock, Thimphu, Bhutan, 2023.
23 "RNR Strategy 2040", Royal Government of Bhutan, Ministry of Agriculture and Livestock, Thimphu, Bhutan, 2021.
24 Farming population declined from 87% in 1995 to 54 % in 2023 (RNR Strategy 2024).

Geography: Only 2.96 per cent of Bhutan's total area was classified as arable land in 2023.[25] Over the last two decades, agricultural land has declined by almost eight per cent, directly impacting production. The average landholding size is 3.7 acres, but not all land is cultivated. As of 2021, approximately 20 per cent of this arable land remains fallow.[26]

Farming profitability is extremely low, and agriculture credit is limited compared to other sectors.

Technology Challenges: Bhutan's rugged mountainous terrain and diverse agroecological zones add technological challenges for agriculture, increasing production costs and complicating the adoption of improved technologies. Only 24 per cent of agricultural land is mechanised and just nine per cent of farmers produce for sale, limiting market-oriented production.[27] Farming profitability is extremely low, and agriculture credit is limited compared to other sectors. Moreover, most agricultural players have a low level of education, making technological innovations challenging to implement.[28]

Climate Change: Bhutan's susceptibility to climate change and natural calamities exacerbates crop damage from extreme weather.[29]

Human-Wildlife Conflict: Human-wildlife conflict is a major concern for Bhutan's farmers, further complicated by stringent wildlife conservation policies. On average, farmers in Bhutan lose between 19 per cent and 43 per cent of their farm products annually due to wildlife damage despite guarding their fields for three to four months.[30]

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25 Norman Myers, et al, "Biodiversity hotspots for conservation priorities", *Nature*, 403(6772), 853-858, 2000; and MoAL, "Annual Progress Report 2022-2023", Ministry of Agriculture and Labour, Thimphu, Bhutan, 2023, https://www.nature.com/articles/35002501.

26 Rattan Lal, "Soil Degradation and Food Security in South Asia", in R Lal, M V K Sivakumar, S M A Faiz, A H M Mustafizur Rahman, and K R Islam (eds.), *Climate Change and Food Security in South Asia*, 2011, https://doi.org/10.1007/978-90-481-9516-9_10; and MoAF, "Policy Brief: Conversion of fallow land in Bhutan: A national Food Security Challenge, 202", Ministry of Agriculture and Forest, Thimphu, Bhutan, 2021.

27 "RNR Annual Report 2021-2022, RNR Strategy 2040", Ministry of Agriculture and Livestock, Thimphu.

28 Raheem Olatunji Aminu, et al, "Impact of socio and demographic factors on multidimensional poverty profile of smallholder arable crop farmers: evidence from Nigeria", *International Journal of Social Economics*, 49, 107–123, 2022 https://doi.org/10.1108/IJSE-12-2020-0834·

29 In Bhutan, natural disasters like storms, flashfloods and extreme variations in climate and weather patterns are some of the major causes of huge crop and livestock losses.

30 Sanjay Wangchuk, et al, "Exploring Human-Wildlife Conflict and Implications for Food Self-Sufficiency in Bhutan", Sustainability, 15(5), 4175, 2023; and Pritha Datta, Dil Bahadur Rahut, Bhagirath Behera, Tetsushi Sonobe, Sandip Chand, "Human coexistence with leopards and elephants: Losses and coping strategies in an Indian tiger reserve", Trees, Forests and People, 16, 2024, https://doi.org/10.1016/j.tfp.2024.100518.

Low Productivity: Agriculture's livelihood opportunities are dwindling as men and young people leave the rural areas for better jobs. This has increased the labour burden on women smallholder farmers, resulting in the agricultural sector's low labour productivity. As of 2022, 53 per cent of agricultural workers were women, compared to 36.1 per cent of men. Additionally, over 70 per cent of rural female employment is in agriculture, compared to 5.5 per cent in urban areas.[31] Moreover, the shortage of irrigation water has restricted farming times and productivity.

Declining Contribution to Economic Growth: The sector's contribution to GDP has significantly dropped from 38.6 per cent in FY1980/81 to 14.7 per cent in 2022 driven by lower crop production, erratic rainfall patterns and declining labour productivity.[32] The farming population decreased from 87 per cent in 1995 to 54 per cent in 2023. In 2022, the gross value addition per capita in the agriculture sector was about 10.4 per cent below GDP per capita.[33]

Weak Marketing Strategy: A lack of a marketing strategy, cheap imports and an uncertain market for RNR products deter private investment in farming. Inadequate marketing information and a weak agriculture marketing system impede demand-driven production and marketing opportunities. Furthermore, an excessive focus on smallholder farmers and the exclusion of the private sector have restrained innovation, mechanisation, promotion of smart technologies and expeditious expansion of the scale of production.

Inadequate marketing information and a weak agriculture marketing system impede demand-driven production and marketing opportunities.

Policy Incoherence: The RNR sector operates under more than 16 legal and policy frameworks, and, hence, needs policy consistency. There are conflicting goals regarding intensification versus conservation and organic farming versus agrochemical use. These conflicting policies and a need for more evidence-based planning and cohesive strategies

31 Emily Amondo, Franklin Simtowe, Dil Bahadur Rahut, Olaf Erenstein, "Productivity and production risk effects of adopting drought-tolerant maize varieties in Zambia", *International Journal of Climate Change Strategies and Management*, 11, 570–591, 2019, https://doi.org/10.1108/IJCCSM-03-2018-0024; NSB, "Statistical Year Book of Bhutan", National Statistical Bureau, Thimphu, Bhutan, 2023.

32 "RNR Strategy 2040", Ministry of Agriculture and Forest, 2021.

33 Royal Monetary Authority, "Annual Report 2023", Thimphu, Bhutan.

Additionally, more advocacy and awareness among the stakeholders about the implementation of current policies and legislation is required.

lead to fragmented operations. Moreover, the sector needs to include important policies for price regulation, fiscal incentives to make farming more attractive, marketing strategies, import management, insurance policies to cover losses due to human-wildlife conflict or natural disasters and ecosystem service accounting. Additionally, more advocacy and awareness among the stakeholders about the implementation of current policies and legislation is required.

Government Efforts to Overcome the Challenges

The following are several key initiatives to overcome the challenges relating to food insecurity.

- **Million Fruit Tree Plantation Project:** The Million Fruit Tree Plantation (MFTP) project was launched in 2022 to enhance food security in rural communities. The project aimed to plant around 1.48 million fruit seeds of 22 different high-value varieties nationwide. The MFTP is a Royal initiative, and fruit trees are given as Royal Soelra (gifts) to farmers nationwide to improve income and uplift rural livelihoods by creating employment opportunities. This initiative aims to benefit rural farmers, schools, government agencies, religious institutions, private companies and organic corporations, representing considerable progress toward sustainable and nutritious food production.[34]

- **Chain-link Fencing:** Wildlife-induced losses to crops and livestock in Bhutan have hindered agricultural production over the years. To address these issues and support the local farmers, the government of Bhutan has actively promoted and financed electric fencing nationwide, safeguarding farmland from wildlife-induced damages.[35]

[34] "RNR Annual Report 2021-2022, Food and Nutrition Security Policy of Bhutan 2023", Ministry of Agriculture and Livestock, 2023.

[35] Ministry of Agriculture and Livestock, "The National Impact Assessment Report on Electric Fencing", Ministry of Agriculture and Livestock Reports, 2021.

- **Irrigation Projects:** Various water projects have been implemented across different regions of the country, enhancing agricultural productivity and water efficiency. As of 2023, around 40 water projects have been completed, of which nine are irrigation water projects.[36]

Various water projects have been implemented across different regions of the country, enhancing agricultural productivity and water efficiency.

- **Agriculture Commodity Marketing Initiative:** The digital platform, launched in 2022, bolsters the Agriculture Marketing Information System by delivering weekly updates from major markets, aiming to streamline trade and improve market access for farmers.

- **Online Registration and Information Management of Farmer Groups and Cooperatives:** The initiative introduced in 2022 aims to streamline the registration and management processes for farmer groups and cooperatives, promoting collaboration and coordination within the agricultural sector.

- **Bhutan Commodity Exchange Initiative:** This initiative aims to improve market efficiency and price transparency for agricultural commodities, benefiting both farmers and traders.

- **A Conducive Farming Environment:** The government of Bhutan is set to allow 100 per cent foreign direct investment (FDI) in the agriculture sector, an increase from the current 74 per cent.[37] These changes will enable foreign agriculture investors to establish companies without needing a local partner.

36 National Service Water Project – Guardian of Peace, desuung.org.bt.
37 Y K Poudel, "Agriculture Sector to Allow 100 percent FDI", Kuensel - National Newspaper of Bhutan (ekuensel.com), 16 May 2024.

- **Long-term Framework for Agriculture Development:** Bhutan recently launched the Food and Agriculture Organization of the United Nations framework for 2024-2028, outlining four key priorities:

    1. **Sustainable Agrifood System Transformation:** Accelerating investment, entrepreneurship, product development and employment in high value agrifood value chains for international markets, using sustainable natural resources.

    2. **Food Security, Safety and Nutrition-Sensitive Agriculture:** Enhancing food security, promoting safe and nutritious food, and implementing climate-smart agricultural practices.

    3. **Sustainable Natural Resources Management:** Mitigating and adapting to climate change, managing disaster risks and ensuring sustainable natural use.

    4. **Evidence-based Agrifood Systems Planning:** Using data-driven planning and programming at national and local levels for effective decision-making.

Policy Recommendations

Empowering women in agriculture through education, access to land and resources, and participation in decision-making processes is also crucial.

Addressing food security challenges in countries with similar agrarian economies like Bhutan requires prioritising sustainable agriculture, which is also a cornerstone of socioeconomic development and growth. This involves promoting eco-friendly farming practices, investing in agricultural infrastructure, providing access to finance and resources for smallholder farmers, and implementing policies that support inclusive agricultural growth. Empowering women in agriculture through education, access to land and resources, and participation in decision-making processes is also crucial. Additionally, diversifying and improving crop yields, enhancing post-harvest management and

integrating technology into agricultural practices are essential to global food security. The key policy recommendations include:

- **Embracing Digital Technology:** Digital technology in agriculture is essential for sustainable agriculture growth. Integrating tools like satellite imagery, drones, remote sensing and geographic information systems can revolutionise farming practices in a challenging geography. However, bridging the digital divide, especially in rural areas, is vital for maximising these advancements. For instance, Bhutan's high literacy rate and skilled workforce offer a comparative advantage, but affordable internet access is key to ensuring inclusive rural development and empowering all stakeholders to contribute to sustainable goals.

Integrating tools like satellite imagery, drones, remote sensing and geographic information systems can revolutionise farming practices in a challenging geography.

- **Promoting Innovation and Research in Agriculture:** Countries should promote and adopt innovative, labour-saving agricultural methods such as vertical and horizontal farming, climate-smart techniques, precision farming and advanced crop water management technologies. Supporting innovative financing strategies, including public-private partnerships, FDI, blended finance and cost-sharing models, is essential for advancing the agricultural sector. Systematic research, transformational innovation and timely dissemination of findings should drive agricultural development. An integrated research strategy can help combine sectoral research efforts and strengthening research and data analytics through local, regional and institutional collaboration is crucial for boosting agricultural productivity.

- **Revitalising Fallow Land:** To address the issue of fallow land, the following policy measures are recommended:

  1. **Technical and Financial Support:** Provide comprehensive support, including technical assistance and financial incentives, to establish productive agricultural systems on fallow land.

  2. **Innovative Fiscal Strategies:** Explore fiscal strategies such as introducing taxes on fallow land and facilitating land rental arrangements. Implement cost-sharing mechanisms to mitigate risks from natural calamities and other challenges.

  3. **Strategic Prioritisation:** Focus on revitalising fallow land near communities with accessible infrastructure and reliable resources to ensure efficient utilisation and maximise agricultural potential.

- **Engaging Women in Agriculture:** Encouraging women participation in agriculture is critical to increase productivity and achieve food security in several developing economies, such as Bhutan. Empowering the women through elevating their roles in community groups, fostering gender sensitisation, providing gender equality advisory services, offering leadership training, introducing women-friendly farming technologies, improving access to finance and supporting female-headed households can significantly enhance agricultural sectors globally.

Establishing robust regulations and institutions to instil market trust is essential.

- **Expanding Agricultural Market Opportunities:** As a carbon-negative nation, Bhutan has immense potential to promote organic agriculture products regionally and internationally. Establishing robust regulations and institutions to instil market trust is essential. Prioritising the branding and certification of products, investing in infrastructure for secure and cost-effective transportation, identifying niche

markets and establishing market linkages at various levels will help harness market opportunities and accelerate demand for agricultural products.

- **Investing in High-value Agricultural Products:** Prioritising high-value agricultural and livestock products such as fruits, nuts, mushrooms and dairy can boost farmer incomes and create new export opportunities, driving economic growth. Efforts should also focus on enhancing self-reliance in staple foods through incentives like cost-sharing mechanisms or direct subsidies. Optimising the value chain, refining marketing strategies and expanding exports are crucial for ensuring equitable returns for farmers. Exploring untapped export markets, maintaining robust trade relations and investing in critical infrastructure will support sustainable self-sufficiency in essential food items.

- **Promoting Wild Underutilised Crops and Organic Farming:** Promoting organic farming and sustainable use of wild resources can enhance biodiversity and provide diverse benefits such as food, medicine and fuel. Integrating considerations of wild food into food security policies at the regional, national and international levels is essential to bolster rural community resilience. A recent survey found that 47 per cent of farm households (834 surveyed households) collect wild food to address food insecurity in Bhutan.[38] Recognising this, it is essential to integrate food consideration into the regional, national and international food security policies to bolster resilience in rural communities. Governments should enact policies to manage wild food as a public good and preserve biodiversity, serving as a model for sustainable agriculture globally.[39]

Governments should enact policies to manage wild food as a public good and preserve biodiversity, serving as a model for sustainable agriculture globally.

[38] Panharoth Chhay, Dil Bihabur Rahut, Sonam Tashi and Jordan Chamberlin, "Does Wild Food Contribute to Food Security? Evidence from Rural Bhutan", 2023, https://www.adb.org/sites/default/files/publication/871216/adbi-wp1367.pdf.

[39] Ibid.

- **Ensuring Policy Coherence:** To achieve cohesiveness and collaboration within the agriculture sector, it is crucial to harmonise policies. This involves amending existing policies and developing new ones. Creating key policies such as land use, pricing, organic production and intellectual property rights for agricultural products is essential. Addressing these policy gaps will enhance policy effectiveness and drive grassroots agricultural development that will contribute to food security.

Appendix

Table 1: Key Policies and Objectives

Year	Policy	Main objective(s) of the Policy
1992	National Irrigation Policy 1992	It lays down the procedures for irrigation development.
2010	Biosecurity Policy 2010	The policy ensures that food is safe for the Bhutanese, ensures sustainable use of natural resources, protects agricultural products from pests and diseases, and preserves Bhutan's rich biodiversity and natural environment.
2011	National Forest Policy 2011	The policy's goal is the sustainable management of forest resources to provide for the social, economic, ecological, cultural, and spiritual needs of present and future generations, contribute to the country's sustainable development, enhance the quality of human life, and protect biological diversity and ecological processes.
2011	RNR Research Policy 2011	The policy focuses on new ways to coordinate, prioritise, plan and programme, organise, finance, manage and implement RNR research to prepare the system and its clients for the challenges of the 21st century.
2012	National Irrigation Policy 2012	It aims to accelerate investments based on identified needs in the irrigation sector to achieve national food self-sufficiency and food security goals.
2014	Food and Nutrition Security Policy of the Kingdom of Bhutan 2014	The policy emphasises the fundamental rights of Bhutanese to affordable, adequate, safe, nutritious, and culturally acceptable food.
2016	Economic Development Policy 2016	The policy aims to strategise land development and land use to prevent land degradation, address low crop productivity and rural-urban migration issues, and enhance ecosystem services.
2018	RNR Marketing Policy 2018	It aims to strengthen the environment, institutional framework, and RNR marketing infrastructure, enhancing RNR product value addition and marketing.
2023	Food and Nutrition Security Policy 2023	This policy, built upon the foundation of the 2014 FNS Policy, aims to revamp the food system to ensure resilience, maximise performance, and contribute significantly to the economy. Its objectives include ensuring food security for all Bhutanese households, reducing malnutrition, and increasing the agricultural sector's contribution to GDP growth.
2023	Biodiversity Rules and Regulations 2023	The objective of this rule is to implement the provisions of the Biodiversity Act of Bhutan, 2022.

Appendix

Table 2: Acts and Strategies

Year	Acts and Strategies	Main objective(s) of the Acts & Strategies
1969	Forest Act 1969	To establish forest reserves and define rules applicable to activities in such areas.
1993	The Plant Quarantine Act 1993	To control and prevent pests not already present or widespread in the country; to provide facilities for services for the import and export of plants and plant products; and to extend cooperation in the prevention or movement of pests in international trade and traffic.
1995	Forest and Nature Conservation Act of Bhutan (FNCA) 1995	To protect and sustainably use Bhutan's forests, wildlife and related natural resources to benefit present and future generations.
2000	Pesticide Act 2000	To ensure integrated pest management and limit the use of pesticides as a last resort.
2000	Environment Assessment Act 2000	To establish procedures for assessing the potential effects of strategic plans, policies, programmes, and projects on the environment and determining policies and measures to reduce potential adverse effects and promote environmental benefits.
2000	The Seeds Act of Bhutan 2000	To regulate the import and export of agricultural seeds, prevent the introduction of plants and diseases, and promote the seed industry in the country to enhance rural income and livelihood.
2001	The Livestock Act of Bhutan 2001	To regulate livestock breeding, health, and production to enhance productivity, prevent diseases, and enhance rural income and livelihood.
2021	RNR Strategy 2040	Outlines plans to ensure sustainable social and economic well-being for the Bhutanese people through adequate access to food and natural resources by 2040.
2003	Biodiversity Act 2003	To ensure the national sovereignty of the RGOB over genetic resources per relevant National and International Law. To ensure the conservation and sustainable use of the biochemical and genetic resources.
2005	Food Act of Bhutan 2005	Protect human health and regulate and facilitate food import, export, and trade in the Kingdom of Bhutan.
2007	Land Act of Bhutan 2007	The Act grants the Ministry of Agriculture and Forests (MoAF) the sole rights to review and approve the conversion of wetlands (paddy fields) to other land use categories.
2011	Water Act of Bhutan 2011	To ensure that the water resources are protected, conserved, and/or managed economically, socially equitable and environmentally sustainable.
2022	Biodiversity Act of Bhutan 2022	This act emphasises biodiversity conservation and sustainable use, ensuring people's and communities' access to genetic and biological resources.

How Food Secure is India?

Biswajit Dhar

India provides an unseemly spectacle of overflowing granaries that cannot mitigate the unacceptable levels of undernourishment that have long existed in the country. During the past several decades, while India has emerged as a country that is among the largest producers of food, the major cereals in particular, it is also the country that is home to the largest number of undernourished. It is a contradiction that establishes the fact that a country's achieving the target of food self-sufficiency is not *sine qua non* for making its citizens' food secure. Realising the objective of food security is constrained by the lack of purchasing power and inefficient distribution systems. Even though successive governments in India have used welfare schemes to reduce food insecurity in the country, woefully slow progress has been made over the decades. In 2021, a billion people in India were unable to afford a healthy diet, according to the Food and Agriculture Organization of the United Nations (FAO).[1]

During the past several decades, while India has emerged as a country that is among the largest producers of food, the major cereals in particular, it is also the country that is home to the largest number of undernourished.

Since the mid-1960s when the Green Revolution technologies were adopted, adequate domestic supplies of food have never been a problem for India.[2] Now, however, there are concerns that climate change could make its impact felt on the country's food production. Some evidence is already emerging that climate change-induced weather variability is impacting India's domestic production of food.

This paper analyses the challenges to food security that India has been facing and the nature of emerging climate-induced threats that it will have to contend with. Considering the evidence that this paper will provide, two sets of policy interventions are urgently needed to reduce food insecurity in the country. Firstly, addressing chronic hunger and malnutrition through macroeconomic interventions that can assure additional incomes to the poor. Secondly, urgently responding to

1 FAO, "FAOSTAT: Cost and Affordability of a Healthy Diet (CoAHD)", 2023, https://www.fao.org/faostat/en/#data/CAHD.

2 Biplab Dasgupta, "India's Green Revolution", *Economic and Political Weekly Vol. 12*, No. 6/8, 1977, https://www.jstor.org/stable/4365324.

the climate-induced threats to agriculture by developing agricultural infrastructure and increasing support to agricultural research for developing resilient crop varieties.

Assessing the State of India's Food Security

This section looks at several indicators to assess India's food security. We first analyse FAO's data on food balances that provide the supply side situation of a country. We then focus on the food security indicators that are typically used to understand the progress being made towards the realisation of Goal 2 of the Sustainable Development Goals (SDGs).[3]

Food Balances in India

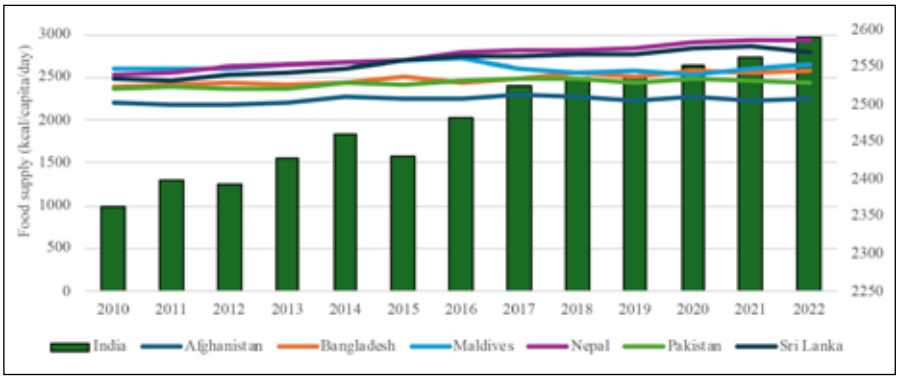
In contrast, the Southeast Asian countries, whose DES was much higher at 2,631 kcal/cap/day in 2010 were able to increase this figure by 9.5 per cent to 2,880 kcal/cap/day in 2022.

The FAO's Food Balances database shows that global food supply, measured by the per capita dietary energy supply (DES), increased by five per cent between 2010 and 2022 (from 2,834 kcal/cap/day to 2,985 kcal/cap/day). During the same period, an increase in DES in South Asia registered an increase of nearly eight per cent (from 2,421 kcal/cap/day to 2,606 kcal/cap/day). In contrast, the Southeast Asian countries, whose DES was much higher at 2,631 kcal/cap/day in 2010 were able to increase this figure by 9.5 per cent to 2,880 kcal/cap/day in 2022.

India's DES increased from 2,363 kcal/cap/day in 2010 to 2,589 kcal/cap/day in 2022, or by 9.6 per cent. This increase was higher than both the global average and the Southeast Asian countries. However, India's DES did not compare well with those of Nepal, Sri Lanka and the Maldives (Figure 1).

[3] SDG 2 is about a world free of hunger by 2030. See UN General Assembly, "Sustainable Development Goals: Resolution adopted by the General Assembly on 25 September 2015", 2015, A/RES/70/1, https://www.un.org/en/development/desa/population/migration/generalassembly/docs/globalcompact/A_RES_70_1_E.pdf.

Figure 1: State of India's Food Balances



Note: 'India' is shown on the right axis.
Source: FAO. 2023. FAOSTAT: Food Balances (2010-). https://www.fao.org/faostat/en/#data/FBS.

While absolute dietary energy supply in per capita terms helps in assessing a country's food supply, trends in the percentage of average dietary energy supply adequacy are more than a useful complementary indicator. This indicator measures the dietary energy supply as a percentage of the average dietary energy requirement, and, therefore, helps in benchmarking the energy supply in a country against its requirement.

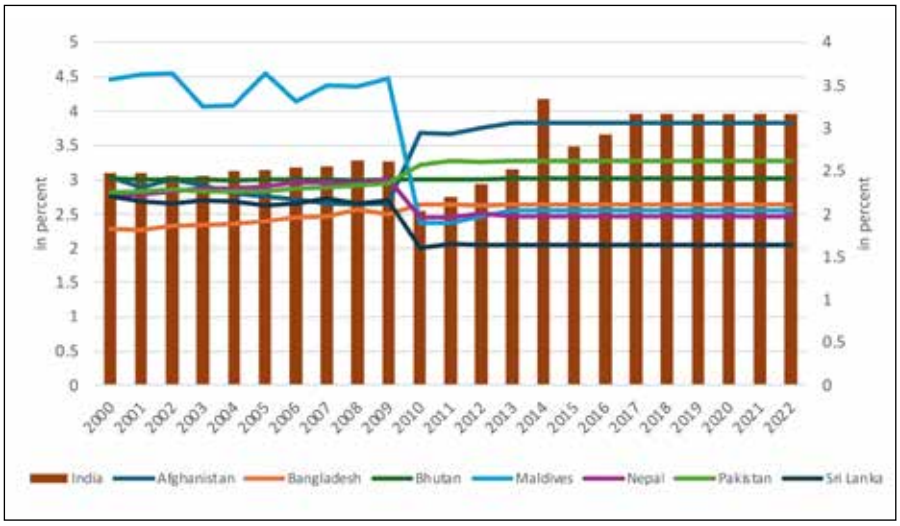
Data available from the FAO since the beginning of this millennium shows that between 2003 and 2006, the average dietary energy supply in India was just about meeting its requirements. This situation changed considerably until 2016-18, a period that recorded a steady increase in this indicator. However, over the next four years, average dietary energy supply adequacy stagnated, and at a level lower than those recorded by four South Asian countries. India, thus, faced an apparent conundrum from the end of the previous decade, namely, a steadily increasing DES as discussed above, together with a stagnating average dietary energy supply adequacy. The explanation in this regard lies in the observed trends in the 'incidence of caloric losses at retail distribution level' (Figure 2), which is a proxy for food wastage.

This situation changed considerably until 2016-18, a period that recorded a steady increase in this indicator.

In the first decade of the new millennium, India's food wastage decreased by nearly 18 per cent, while in the second decade, food wastage increased by 55 per cent. This explains why, despite steady increases in the domestic food supply, the level of undernourishment

in India has remained stubbornly high. As we shall show below, the caloric losses at the retail distribution level correspond to some extent to the levels of undernourishment in the country and, consequently, the rising food insecurity.

Figure 2: Incidence of Caloric Losses at the Retail Distribution Level



Note: 'India' is shown on the right axis.
Source: FAO. 2024. FAOSTAT: Suite of Food Security Indicators. https://www.fao.org/faostat/en/#data/FS.

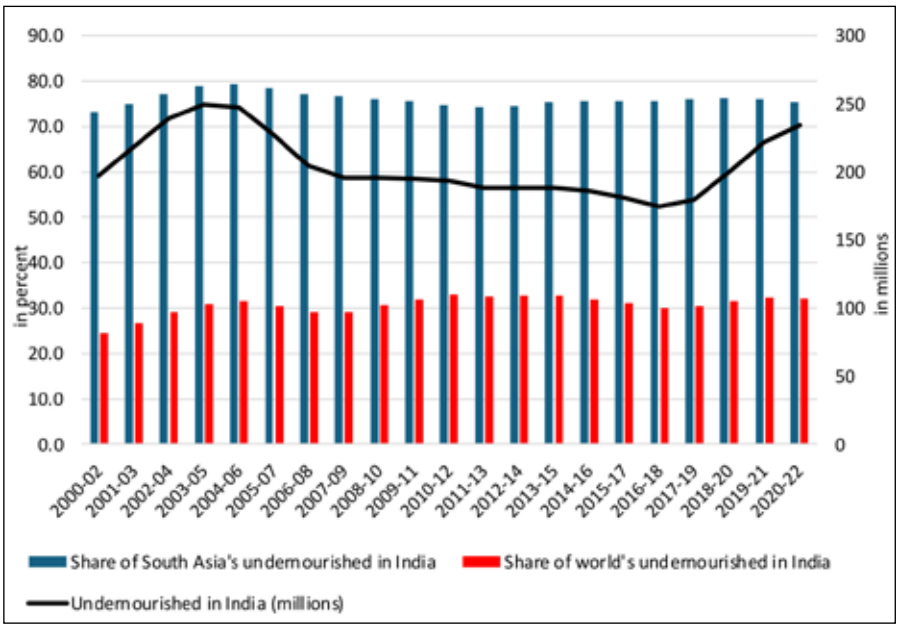
Dimensions of Food Insecurity in India

The hunger and destitution caused by COVID-19 maintained the rising trend.

According to the FAO, the three-year average of the number of undernourished in India between 2020 and 2022, the most recent period for which this data was available, was 234 million (Figure 3). During this period, India was home to over 32 per cent of the total undernourished people in the world. The proportion of the world's undernourished in India had declined from the peak of 33 per cent in 2010-11 to 30 per cent during 2016-18 but began climbing immediately thereafter. The hunger and destitution caused by COVID-19 maintained the rising trend. Further, in 2020-21, more than three-fourths of the total undernourished in South Asia were living in the world's then second-most populous country.[4]

4 FAO reports the figures for the undernourished in all South Asian countries except Bhutan and the Maldives.

Figure 3: Number of Undernourished in India



Note: 'Undernourished in India' shown on the right-axis.
Source: FAO. 2024. FAOSTAT: Suite of Food Security Indicators. https://www.fao.org/faostat/en/#data/FS.

India's efforts at reducing the number of undernourished after the turn of the millennium was one of most remarkable in the developing world. In 2003-05, the number of undernourished in India peaked at 250 million, almost 31 per cent of the total undernourished in the world. Since the middle of the 2000s, the number of undernourished began to decline, and in 2017, it was the lowest at 174 million. Since then, however, the declining trend has reversed. The ranks of the undernourished had swelled to 233 million during 2020-22. This figure was higher than the corresponding figure during 2005-07, implying that the efforts at reducing undernourishment spanning a decade and a half were undone in just four years.

In 2003-05, the number of undernourished in India peaked at 250 million, almost 31 per cent of the total undernourished in the world.

The recent trend of a sharp increase in undernourishment is a grim reminder that the past efforts to improve the condition of a large segment of the undernourished did not change substantially. They overcame the threshold of undernourishment only in statistical terms but remained vulnerable to adverse events affecting the macroeconomy.

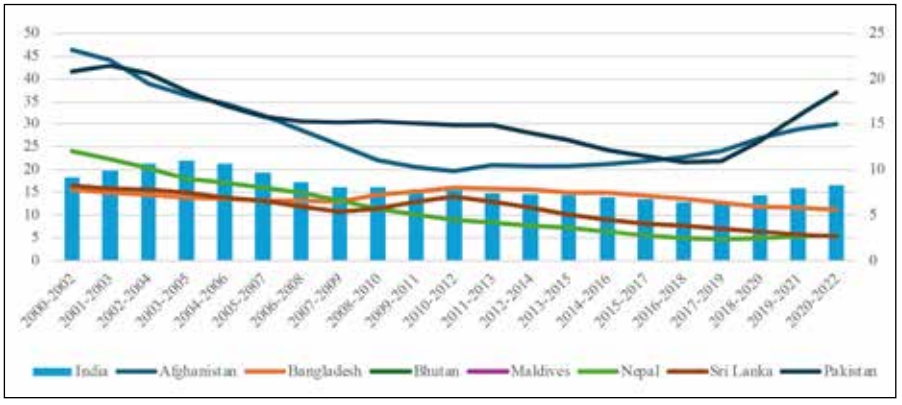
Prevalence of Undernourishment

This is a crucial indicator to assess the extent to which food insecurity exists in a country/ region.

The prevalence of undernourishment (PoU) estimates the proportion of the population whose habitual food consumption is insufficient to provide the dietary energy levels that are required to maintain a normal, active and healthy life. This is a crucial indicator to assess the extent to which food insecurity exists in a country/region.

The PoU in India was 16.4 per cent during 2020-22, the third highest among the South Asian countries. Figure 4 shows that until 2009-11, India's PoU was the second worst in the region, only after Afghanistan. Mirroring the trend in the number of undernourished, the PoU decreased continuously from its peak in 2003-05, decreasing rapidly until 2011-13 and moderating thereafter. The reversal of this trend since 2018-20 is a worrying sign that needs to be remedied urgently.

Figure 4: Prevalence of Undernourishment



Note: 'India' is shown on the right axis.
Source: FAO. 2024. FAOSTAT: Suite of Food Security Indicators. https://www.fao.org/faostat/en/#data/FS.

Finally, the FAO's recently released series on "population unable to afford a healthy diet" shows that in 2021, more than a billion people in India, or 74 per cent of the total population belonged to this category.[5] This is yet another pointer to the large magnitude of the

[5] FAO, IFAD, UNICEF, WFP and WHO, "The State of Food Security and Nutrition in the World 2023: Urbanization, Agrifood Systems Transformation and Healthy Diets across the Rural–Urban Continuum", FAO, 2023.

problem of food insecurity prevailing in the country. The only positive aspect is that the share of the population unable to afford a healthy diet has decreased from almost 79 per cent in 2017. This is certainly a positive augury, given the economic distress that was caused by the pandemic.

Government Welfare Schemes to Reduce Hunger and Food Insecurity

The discussion in the preceding section may lead some to suggest that a rapidly growing economy during 2007-08 triggered India's fight against undernourishment. During this time, the Indian economy recorded almost double-digit growth rates for three consecutive years, which was unprecedented. While the benefits of high economic growth for the poor is a contested issue, especially because the so-called "trickle down" theory is thin on evidence, what mattered most in India's war on food insecurity was the then government's decision to initiate welfare programmes for augmenting incomes of households in rural areas. The most important step in this direction was taken through the enactment of the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) in 2005.[6] The programme launched through the MGNREGA is designed to enhance the livelihood security of rural households across the country by providing at least 100 days of guaranteed wage employment in a financial year to every rural household whose adult members volunteer to do unskilled manual work. The creation of durable assets and strengthening the livelihood resource base of the rural poor is an important objective of the scheme.

The creation of durable assets and strengthening the livelihood resource base of the rural poor is an important objective of the scheme.

A second initiative, discussions on which were initiated almost at the same time as the enactment of the MGNREGA, was to expand the beneficiaries of the public distribution system in recognition of the fact that a high proportion of Indians suffered from food insecurity. Accordingly, the National Food Security Act (NFSA) was enacted in

6 For details of MGNREGA and the functioning of the programme see, Government of India, "Mahatma Gandhi National Rural Employment Guarantee Scheme", Ministry of Rural Development, 2024, https://nrega.nic.in/MGNREGA_new/Nrega_home.aspx.

2013.[7] The NFSA, according to the government, "marks a paradigm shift in the approach to food security from welfare to rights-based approach". In other words, this Act recognised the citizens' "right to food". The objective of the Act was to "provide food and nutritional security in human life cycle approach, by ensuring access to adequate quantity of quality food at affordable prices to people to live a life with dignity". The NFSA includes a legal entitlement to 75 per cent of the rural population and 50 per cent of the urban population to receive subsidised food grains under the Targeted Public Distribution System. Thus, about two-thirds of the population is covered under the Act to receive highly subsidised food grains.

In November 2023, the government announced that 813.5 million people, or close to 60 per cent of the country's population would be provided free food grains until the end of 2028.

The government recognises that although the Indian constitution does not have explicit provision assuring the right to food, "the fundamental right to life enshrined in Article 21 of the Constitution may be interpreted to include right to live with human dignity, which may include the right to food and other basic necessities".[8] In November 2023, the government announced that 813.5 million people, or close to 60 per cent of the country's population would be provided free food grains until the end of 2028. The notification elaborated that "free food grains (rice, wheat and coarse grains/ millets)…will strengthen food security and mitigate any financial hardship of the poor and vulnerable sections of the population".[9]

Though they were intended to reduce hunger and food insecurity, enabling India to effectively implement Goal 2 of the Sustainable Development Goals, the two welfare measures referred to above have been less than effective as the discussion in the earlier sections indicates. This has largely been due to inadequate financial support from the government, particularly in the post-COVID-19 years.

6 For details of MGNREGA and the functioning of the programme see, Government of India, "Mahatma Gandhi National Rural Employment Guarantee Scheme", Ministry of Rural Development, 2024, https://nrega.nic.in/MGNREGA_new/Nrega_home.aspx.

7 Details of the implementation of NFSA can be accessed from the Government of India, "National Food Security Portal", Department of Food and Public Distribution, 2024, https://nfsa.gov.in/portal/NFSA-Act.

8 Government of India, "National Food Security Portal", Department of Food and Public Distribution, 2024, https://nfsa.gov.in/portal/NFSA-Act.

9 "Free Foodgrains for 81.35 crore beneficiaries for five years: Cabinet Decision", Ministry of Consumer Affairs, Food & Public Distribution, 29 November 2023, https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1980689.

Spending on both these programmes has been reduced in nominal terms. Between 2021-22 and 2023-24, the three financial years following the pandemic, budgetary allocation for the MGNREGA fell by 13 per cent and that for the NFSA by more than a fourth (Table 1).

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The government's response to its decreasing allocation towards the MGNREGA has been that the programme is "demand-driven", and so the spending on the programme reflects the demand for the 100-day work that the programme offers. However, a Parliamentary Committee that reviewed the programme in 2022 observed that there was a delay in the payment of wages, which could explain the lack of interest of potential beneficiaries.[10] As regards the NFSA, the reasons for declining allocations are unclear.

Table 1: Budgetary Support for MGNREGA and NFSA (Figures in ₹ Billion)

Years	MGNREGA		NFSA	
	Budget Estimates	Actual Spending/ Revised Estimates	Budget Estimates	Actual Spending/ Revised Estimates
2019-20	600.0	716.9	1,184.0	1,085.1
2020-21	615.0	1,111.7	1,153.2	5,411.3
2021-22	730.0	984.7	2,426.2	2,887.2
2022-23	730.0	908.1	2,064.8	2,728.0
2023-24	600.0	860.0	1,970.0	2,123.3

Source: Union Budget, various years. https://www.indiabudget.gov.in/.

Prevailing food insecurity in India may be exacerbated further if adequate measures are not taken to meet the challenges of weather variability caused by climate change. The following section discusses the impact that 'heat stress' has had on the output of wheat during the 2023-24 crop year.

[10] "Standing Committee on Rural Development and Panchayati Raj (2021-22), Critical Evaluation of Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA): Twentieth Report", Lok Sabha Secretariat, New Delhi, 2022.

Impact of Climate Change on Indian Agriculture

For the third consecutive year, there are uncertainties regarding the production level of wheat, India's second most important staple. This is caused by unexpected changes in weather patterns, especially significantly higher temperatures, commonly known as 'heat stress', during the wheat grain filling period. Studies show that the impact of 'heat stress' was more evident in key wheat-growing states in North India, where wheat productivity declined significantly during the 2021-22 rabi planting season. In Punjab, for instance, the decline in productivity was 13.5 per cent compared to the previous year.[11] In fact, scientists have estimated that for every one-degree Celsius increase in temperature, wheat production reduces by 4-5 million tonnes.[12]

The decline in production has reduced the domestic availability of wheat, thus jeopardising the government's targets on two fronts.

Worryingly, the adverse effects of 'heat stress' are threatening to reverse the substantial improvements in wheat output that were witnessed between 2014-15 and 2020-21. During this period, wheat output increased from 86 million tonnes to nearly 110 million tonnes. The decline in production has reduced the domestic availability of wheat, thus jeopardising the government's targets on two fronts. First, by lowering publicly held stocks, namely, buffer stocks, critical for providing subsidised food grains to the poor as well as for conducting open market operations necessary to keep domestic wheat prices in check. Secondly, lower output has affected the government's aspirations for transforming India into an agriculture export hub.

The latter aspirations were fuelled during 2021-22 when India was among the major exporters of wheat, exporting a record level of over 7.2 million tonnes of the commodity. However, with wheat output declining in 2022 after increasing continuously for six years between 2015-16 and 2020-21, the government banned wheat exports to "manage the overall food security of the country and control the

11 Gobinder Singh, Amit Salaria, Harinder Singh and Rajan Bhatt, "Terminal heat stress in wheat and its mitigation options through agronomic interventions", *Indian Farming 73 (05): 15-18*, May 2023, https://bit.ly/45qKGmt.

12 Rajesh Kumar Mall, Ranjeet Singh, Akhilesh Gupta, Govindarajalu Srinivasan and L. S. Rathore, "Climate Change and its Impact on Indian Agriculture", Intensive Agriculture, 2023, https://bit.ly/4b1UHaQ.

increasing prices of foodgrains".[13] However, even while imposing the export ban, the government decided to "continue with deals which are done directly with other governments"[14] resulting in exports of more than 4.6 million tonnes during 2022-23. However, with wheat production declining during the year, continued wheat exports made its impact felt on the domestic food reserves, or the buffer stocks, as shall be discussed below.

In 2022, excessive temperatures in March adversely affected wheat production, lowering the output by almost four million tonnes below the government's prediction for the year. The official target for wheat output of 113 million tonnes was again missed by almost three million tonnes the following year. In the current year, the government expects wheat output to be at its projected level for 2023, but the actual level will not be known until the next several months.

In the current year, the government expects wheat output to be at its projected level for 2023, but the actual level will not be known until the next several months.

Though official figures show that wheat output has settled at around 110 million tonnes during the past two years, the main industry body, namely, the Roller Flour Millers' Federation of India (RFMFI), has argued otherwise. The RFMFI's estimates show that during these years, wheat output levels were lower by at least 10-14 per cent than those projected by the government.[15] In the current year, the RFMFI expects wheat production to be around 105 million tonnes, which is eight per cent lower than the government projection. However, this level of output, according to the industry body, would be about three per cent higher than its estimates of the previous year's output.[16]

Supply constraints have become an area of concern for the government. Hence, India has begun importing significant quantities of wheat since 2017-18. In 2023, imports began in June and have

13 Government of India, "To cool down the prices of wheat and atta, Centre decides to offload 30 lakh metric tons of wheat under Open Market Disposal Scheme (OMSS)", Press Information Bureau 10 February 2023, https://bit.ly/45pT4CN.

14 Aditya Kalra, "India has no immediate plan to lift wheat export ban, commerce minister says", Reuters, 25 May 2022, https://bit.ly/45rQrjA.

15 "Roller Flour Millers' Federation estimates 102mn ton wheat production in the current rabi season", Rural Voice, 23 April 2023, https://bit.ly/45vEny7.

16 CMIE, "Wheat output for MY 2024-25 to rise by 3%: Flour Millers Federation", 10 April 2024. https://bit.ly/3Vrc2o0.

since increased consistently. Until April during this calendar year, India's total wheat imports have been over 70,000 tonnes.[17]

This situation needs to change quickly to prevent a catastrophic decline in wheat production.

There is no doubt that India will find it difficult to enhance the production of wheat, given the significant challenges posed by the consistent rise in temperatures in the immediate pre-harvest phase. Faced with similar imperatives to ramp up wheat production in the mid-1960s, the then government adopted the green revolution with strong research support that allowed the realisation of the objective of food self-sufficiency. The National Mission for Sustainable Agriculture is expected to play a similar role having been tasked with the responsibility of transforming Indian agriculture into an ecologically sustainable and climate resilient production system. At the same time, the National Innovations in Climate Resilient Agriculture aims at "strategic research on adaptation and mitigation, demonstration of technologies on farmers' fields and creating awareness among farmers and other stakeholders to minimise the climatic change impacts on agriculture".[18] However, fiscal support for agricultural research has remained inadequate as increases in budgetary allocations have often not been increased in real terms, which shows a lack of political commitment in this vital area. This situation needs to change quickly to prevent a catastrophic decline in wheat production.

Conclusion

For several decades, India has not only been one of the top producers of food grains in the world, but it has also been the largest exporter of the main staple, namely, rice. At the same time, however, India has continued to be the home of the largest number of the world's food-insecure people. The problem facing the country is both on the supply side, as indicated by trends in food balances, and the inability of an exceptionally sizeable proportion of its citizens to afford a

[17] Government of India, "Export Import Data Bank (Monthly)", Department of Commerce, 2024, https://tradestat.commerce.gov.in/meidb/default.asp.

[18] Government of India, "National Innovation on Climate Resilient Agriculture", Ministry of Agriculture & Farmers Welfare, 2021, https://bit.ly/3VMxS6A.

healthy diet. Unsurprisingly, the prevalence of undernourishment in the country has remained sticky.

Several government welfare programmes have been launched since the mid-2000s, which have not been effective despite some initial successes. Implementation gaps, including inadequate financial support, have been the major hindrances.

Implementation gaps, including inadequate financial support, have been the major hindrances.

In recent years, India has begun to face the impact of climate change, in particular, the 'heat stress' that has adversely affected its winter crop. Given this challenge, India needs to heavily invest in agricultural research, significantly more than the 0.1 per cent of the country's GDP that was spent in 2020-21.

Food Security in the Maldives: Issues and Concerns

Fathimath Shafeeqa

Introduction

The territory of the Maldives covers an area of 90,000 square kilometres (km^2) but 99 per cent of this is ocean.[1] The country's land area is only 300 km^2, making it one of the smallest countries in the world. In 2021, about 20 per cent of the country's total land area, that is, 6,000 hectares, consisted of agricultural land.[2] The total arable land was estimated at 4,000 hectares, of which only 573 hectares were cultivated.[3] The limited arable land limits the agriculture sector's expansion potential in the Maldives. The agriculture sector contributes less than 1.5 per cent to the Maldives' gross domestic product (GDP).

Domestic agriculture production and fisheries help meet less than 10 per cent of the Maldives' national food requirement.

Fisheries is an important economic sector of the Maldives, contributing 3.5 per cent to its GDP. It also constitutes the country's major export item and an important part of the Maldivian diet. The country is self-sufficient in fish, but for staple food items such as flour, rice and sugar, it is completely dependent on imports.[4] Domestic agriculture production and fisheries help meet less than 10 per cent of the Maldives' national food requirement.

According to the Maldives Population and Housing Census 2022, 515,122 people were living in the country during the Census period. They included 382,751 Maldivians and 132,371 foreigners.[5] Besides fisheries, the Maldives' economy is heavily reliant on tourism. These two are the main drivers of economic growth and revenue generation

1 Jesse Chase-Lubitz, "The Maldives is racing to create new land. Why are so many people concerned?", 2024, https://www.nature.com/immersive/d41586-024-01157-7/index.html.
2 World Bank, "Agricultural land (% of land area) – Maldives", World Bank Data, https://data.worldbank.org/indicator/AG.LND.AGRI.ZS?locations=MV.
3 FAO, "FAO country programming framework republic of Maldives 2022–2026", 2022.
4 Ministry of Fisheries, Marine Resources and Agriculture of the Republic of Maldives, "National Fisheries and Agriculture Policy 2019-2029", July 2019.
5 Maldives Bureau of Statistics, http://statisticsmaldives.gov.mv/nbs/wp-content/uploads/2022/07/WPD-2022.pdf.

for the country. The growth in the Maldives' population, along with incoming tourists, are reasons for the high demand for fish and agricultural products in the country.[6]

The Maldives' high dependence on imports to meet its food requirements, and on exports of tourism and fisheries, expose the country highly to external shocks. Global economic downturns, geopolitical tensions and fluctuations in commodity prices severely impact these sectors. As a result, all dimensions of food security (food availability, affordability, access and stability) of the Maldivian people, particularly the vulnerable populations, are affected.

The Maldives' Fisheries and Agriculture Sector

The Maldives experiences two main seasons: the northeast monsoon (Iruvai) from November to March and the southwest monsoon (Hulhangu) from April to October. During the southwest monsoon, rough seas and storms can disrupt fishing activities and the availability of fish catch deteriorates. Such disruptions are critical since fishing is an important source of livelihood and fish is the primary source of protein for Maldivians. On average, fish consumption contributes to nearly 71 per cent of the animal-source protein intake of the population's diet. This is the highest percentage in the world.[7] The country is only self-sufficient in fish.

Such disruptions are critical since fishing is an important source of livelihood and fish is the primary source of protein for Maldivians.

Agriculture is undertaken in both inhabited and uninhabited islands. The total area of the 10 agriculturally prominent islands ranges between 0.5 and 5.17 km^2. Agricultural activities are also undertaken in home gardens and homestead plots. Home gardens vary between 100 and 200 square metres. Plots allocated for field crops are also small, ranging between 100 and 1,000 square metres.

6 Ibid.

7 Abigail Bennett, Pawan Patil, Kristin Kleisner, Doug Rader, John Virdin and Xavier Basurto, "Contribution of Fisheries to Food and Nutrition Security: Current Knowledge, Policy and Research"' Nicholas Institute for Environmental Policy Solutions, 2018, https://nicholasinstitute.duke.edu/sites/default/files/publications/contribution_of_fisheries_to_food_and_nutrition_security_0.pdf.

The soil of the Maldives is geologically young and consists of substantial quantities of unweathered coral parent material, coral rock and sand.

Two major land resource-related constraints for agriculture are a) exceedingly small and highly dispersed land sizes; and b) low altitudes (averaging about one metre above the sea level). The average size of an island is 1-2 km^2, and the islands lie 1-1.5 metres above sea level. Ninety-six per cent of these islands are less than one km^2 in area. The soil of the Maldives is geologically young and consists of substantial quantities of unweathered coral parent material, coral rock and sand.[8]

Agricultural land in the Maldives is categorised into three distinct types. They are the goi land, the homestead plots and the home gardens in the inhabited islands. Some uninhabited islands are leased for agricultural purposes on a long-term basis by the Ministry of Agriculture. The rent collected from the lessee by the ministry is one-eighth of the value of the crops produced. The goi land is usually undeveloped, or it is an idle land which has coconut plantations. This land (on a section of the inhabited island) is rented to the highest bidder. The rent is fixed by the respective government authorities, based on the number of trees the area has.[9]

Overall, with less than 10 per cent of its land area considered arable, the Maldives faces constraints in domestic food production. The agriculture sector, which contributed 4.9 per cent to the Maldives' GDP in 2022, remains underdeveloped with fragmented production and market systems.[10] However, it plays a significant role in providing livelihoods for some rural communities and contributes to food and nutrition security for local populations.

In looking through a gender lens, commercial agriculture in the Maldives is mainly practised by men and is dominated by high-value crops such as banana, papaya, chilli, cucumber and pumpkin, mostly targeted for the resort market. Women largely practise subsistence agriculture, which is the main livelihood for rural, agriculture-dependent populations. Subsistence agriculture, mainly in-home

8 MEE, "Maldives: A Climate Change Kaleidoscope. Male", 2015.
9 Ibid.
10 The World Bank, "Agriculture, Forestry, and Fishing, Value Added (% of GDP) – Maldives", World Bank Data, https://data.worldbank.org/indicator/NV.AGR.TOTL.ZS?locations=MV.

gardens and, to a limited extent, in homestead plots outside of the home area, serves everyday purposes and needs of the family and the community at large. It provides the much-needed fruits and vegetables in the Maldivian diet, as well as timber, stimulants, dyes, medicines, wrapping, cordage and products for other needs.[11]

Food Insecurity Issues

Besides having limited arable land in the Maldives, markets for produce and other agricultural products are also limited to small internal markets. These challenges are exacerbated by limitations in storage and problems in the distribution of food across the nation. Moreover, rapid population growth and urbanisation in the Maldives have led to increased demand for food, water and energy. Urban areas, where the majority of the population resides, face challenges in accessing fresh and nutritious food due to limited agricultural activities and reliance on imported processed foods.[12] The Maldives' dependence on imports to meet over 90 per cent of its food supplies makes it vulnerable to supply chain disruptions, currency fluctuations and trade barriers.[13]

The Maldives' dependence on imports to meet over 90 per cent of its food supplies makes it vulnerable to supply chain disruptions, currency fluctuations and trade barriers.

The Maldivian government provides food subsidies to all the people irrespective of their vulnerability situation. Through the State Trading Organization (STO),[14] the government controls the prices of staples such as rice, flour and sugar. This blanket approach to subsidising food items covers all relevant products that are distributed to all consumers, regardless of income level and spending capability of the consumer, as well as the tourism sector.[15] Such a policy to address food insecurity is not favourable to low-income populations, particularly during certain times. For example, prior to Ramadan (the Islamic month of fasting), islanders gear up to stock foods. It is mostly

11 Fathimath Shafeeqa, "Farmer Adaptation to Climate Change: Case Study of Three Communities in the Maldives – A Thesis Submitted to for the Degree of Doctor of Philosophy in Sociology to the University of Peradaniya", 2023.
12 Ibid.
13 "The Maldives - United Nations Development Programme", United Nations Development Programme, 2021, https://info.undp.org/docs/pdc/Documents/MDV/21-06-03%20PDSAE%20ProDoc%20Signed%20Full.pdf.
14 The STO is a publicly listed company with the majority owned by the government.
15 "Food Insecurity", *The Maldives Financial Review*, 7 April 2022, https://mfr.mv/expenditure/food-insecurity.

the middle and high-income people that are able to keep such stocks. High demand and stockpiling of food during such times shoot up food prices, which negatively affects the vulnerable cohorts of the population. Evidence of this was seen just prior to the last Ramadan this year when the price for a kilogramme of lime, which is a common ingredient used in Maldivian dishes, reached 120 Maldivian rufiyaa (S$10.41). In response, the STO had to begin importing limes and they were provided at 45 Maldivian rufiyaa (S$3.90).[16]

Climate change has emerged as another major challenge to food security in the Maldives.

Climate change has emerged as another major challenge to food security in the Maldives. Rising sea levels, rising sea surface temperatures (SST), increased frequency and intensity of extreme weather events such as cyclones, and changes in precipitation patterns, all induced by a changing climate, have adversely affected the Maldives' fisheries and agriculture sectors. These have impacted ecosystems and local economies. For instance, rising sea levels have caused saltwater intrusion into freshwater sources, disrupting the food production and distribution systems. The fisheries sector has been impacted by changes in SST and ocean pH levels. The tourism sector, which is a major source of income and livelihood for a significant population, appears to be affected by increased temperatures, extreme weather events, sea level and SST rise and changes to marine biodiversity.

Addressing the Vulnerabilities and Suggested Strategies

To deal with the fisheries and agriculture sector challenges, the Maldives has introduced the National Fisheries and Agriculture Policy 2019-2029. This document highlights the key issues that need to be addressed to work towards achieving food security in the Maldives. Some of the most important issues include the lack of existing policies in both fisheries and agriculture sectors, inadequate aquaculture practices, unavailability of land, increase in population density, inadequate air cargo and sea transportation, decline of fish catches due to environmental and economic factors such as shortage

[16] Ibid.

of rural labour, insufficient control of cheap and low quality imported inputs, poor knowledge of the state of forest resources, absence of policies and regulations for the management of mangroves, dearth of technical farming skills, difficulty in accessing credit and ageing farmers.[17]

Addressing the challenges requires a multi-faceted approach, including investments in climate-resilient agriculture, sustainable fisheries management, disaster risk reduction, economic diversification and social safety nets to support vulnerable populations during times of crisis. It also includes improving water management, coastal protection and disaster preparedness measures to safeguard agricultural and fisheries livelihoods.

Encouraging diversification of food sources by promoting local food production, including fruits, vegetables and crops that are well-suited to the Maldivian climate, such as coconut, papaya, taro and other short crops, will help reduce reliance on food imports. Furthermore, it is necessary to improve agriculture productivity by investing in agricultural research, technology and infrastructure to improve productivity and resilience. This includes promoting climate-resilient farming practices, such as agroforestry, sustainable irrigation and soil conservation techniques.

Furthermore, it is necessary to improve agriculture productivity by investing in agricultural research, technology and infrastructure to improve productivity and resilience.

The Maldives has the potential to attain self-sufficiency in certain field crops. Production efficiency must be achieved to make this possible. Currently, the cost of production is high due to the use of imported inputs such as fertilisers. Various types of agricultural inputs are required due to the diversity of the Maldives with respect to the distribution and size of islands, the natural environment, the type of activities carried out and the availability of resources.[18]

17 Ministry of Fisheries, Marine Resources and Agriculture of the Republic of Maldives, "National Fisheries and Agriculture Policy 2019-2029", July 2019.

18 FAO, "Food and Agriculture Organization Maldives Country Programming Framework 2013-2017", 2013, http://www.fao.org/3/a bp579e.pdf.

Governance and management of fisheries need to be strengthened to ensure sustainable exploitation of marine resources focusing on promoting aquaculture. Supporting small-scale fishers and fishing communities through capacity building, access to markets and branding and marketing techniques to add value to the Maldives' fish economy needs to be undertaken. Issues related to supply chains need to be studied since the air and sea transportation systems have been identified as inadequate in the National Fisheries and Agriculture Policy document. This includes improving transportation infrastructure, storage facilities and market access for small-scale farmers and fishers. This will assist in ensuring an efficient and equitable distribution of food from producers to consumers.

These national advocacy programmes could promote nutrition education and awareness of dietary diversity to combat malnutrition.

The Food and Agriculture Organization of the United Nations country programming framework 2022-2026 states that 28 per cent of the population in the Maldives suffer from multi-dimensional poverty,[19] out of which 87 per cent live in the atolls. Eight per cent of the population is affected by monetary poverty,[20] while 17 per cent of children under five years of age are underweight. Therefore, empowering vulnerable groups, including women, children, the elderly and people with disabilities, to enable access to nutritious food and participate in decision-making processes that affect their food security can be done through national programmes advocating for this issue. These would have an impact on the underlying social determinants of food insecurity, including poverty, inequality and social exclusion. These national advocacy programmes could promote nutrition education and awareness of dietary diversity to combat malnutrition. Furthermore, it could encourage the consumption of locally available nutritious foods and discourage reliance on processed and unhealthy imported foods.

It is also important to foster coordination and collaboration among government agencies, civil society organisations and international

19 The World Bank, "Maldives Development Update: A digital dawn", April 2021.

20 National Bureau of Statistics, Oxford Poverty and Human Development Initiative (OPHI), and UNICEF Maldives Country Office, "National Multidimensional Poverty Report in Maldives: Summary Report", 2020, https://statisticsmaldives.gov.mv/nbs/wp-content/uploads/2020/06/MPI-Summary-Report-Updated.pdf.

partners to develop and implement integrated food security policies and programmes. The policies need to be aligned with national development goals and international commitments such as the Sustainable Development Goals. Finally, strengthening regional and international partnerships can help the Maldives build resilience to food insecurity and adapt to changing environmental and economic conditions.

Food Security in Nepal in the Context of Large-scale Outmigration of the Youth

Yamuna Ghale

Introduction

In today's globalised world, mobility and migration are increasingly critical parts of people's lives and aspirations. This is particularly true for young individuals who are migrating either for better opportunities overseas or are compelled to move to meet their livelihood needs. Nepal has a long history of migration, particularly highlighted by Nepali youth serving as security personnel in several countries.

Moreover, from a food security perspective, the acute shortage of labour in productive sectors such as agriculture has become a grave concern for Nepal.

A new wave of migration has emerged in Nepal, driven by the search for better education, employment and income.[1] This has had direct and indirect impacts on Nepal's food security. On the one hand, remittances that are sent back to Nepal by overseas workers have eased the lives of people back home by enabling access to food of their choice. On the other hand, this has also increased health risks due to unhealthy food consumption habits, particularly in towns and big cities. Moreover, from a food security perspective, the acute shortage of labour in productive sectors such as agriculture has become a grave concern for Nepal.[2]

The shortage of young labour force in agriculture has driven children, women and the elderly to manage farms. This complex situation underscores the need to engage in policy discussions exploring the interrelations between labour, migration, food security and Nepal's agrarian economy.

1 T R Timsina, "Impact of Youth Migration on the Agricultural Sector in Nepal", *Rupantaran: A Multidisciplinary Journal*, Vol. 80, no. 1 (March 2024): 87-103.
2 Ibid.

Migration and Food Security: The Interlinkage

There is an increasing trend of youth outmigration in Nepal. The Nepal Labour Migration Report 2022 shows that between fiscal year 2019-20 and 2021-22, more than 1.1 million labour approvals for foreign employment were issued by the government. This was reduced briefly during the COVID-19 pandemic. With the lifting of COVID-19 restrictions in Nepal and globally, outmigration was back on track. Currently, the outmigration figures have surpassed those prior to the pandemic.

The outmigration of Nepali youth has significant implications on agriculture, which is fundamental for food security. Nepal's latest Population Census of 2022 shows that 62 per cent of the country's population is engaged in agriculture for their livelihoods.[3] Of those people engaged in agriculture, 70 per cent are women and 26 per cent are women-headed households. This is due to increasing male outmigration from Nepal. The feminisation of agriculture has had an impact on the country's agriculture and food security.

Nepal's latest Population Census of 2022 shows that 62 per cent of the country's population is engaged in agriculture for their livelihoods.

It is concerning that the two major provinces with high potential for agricultural growth, Madhesh and Koshi, are also the provinces with the highest number of outmigrants. A reason for this could be the lack of access to adequate resources and the lack of adequate return from agriculture. When 27 per cent of the people engaged in agriculture in Nepal are smallholder farmers with less than 0.5 hectares of land, agriculture alone might not be the source of their livelihood and food security.

With a score of 15 on the Global Hunger Index, Nepal has a 'moderate' level of food insecurity.[4] The food insecurity situation varies across different scales such as provinces, gender, education, ecological range and income groups. For example, the Nepal Health and Demographic Survey 2022 reflects that only 56 per cent of women in the age group of

3 National Statistics Office, "National Sample Census of Agriculture Nepal 2021/2022", Government of Nepal, 2023.
4 Welthungerhilfe (WHH) and Concern Worldwide, "The Power of Youth in Shaping Food Systems", Global Hunger Index, Bonn/Dublin, 2023.

15-49 years manage to consume the minimum dietary requirements (MDRs). In terms of geography, 46 per cent of the population in the rural areas and 60 per cent in the urban areas can meet their MDRs. Similarly, 84 per cent of the wealthier population manage to maintain the MDRs, as opposed to 35 per cent of the disadvantaged groups.[5]

Viewed from the perspective of the intersectionality of the population, women in the Madhesh province do not adequately consume protein-rich foods such as eggs and dairy products compared to women in other provinces. Muslim women have less access to green vegetables compared to Brahmin and Chhetri women.

A study has shown that a majority of the families of migrant labourers in Nepal largely rely on remittances for food purchases.

Several factors have a bearing on the situation of Nepal's overall food security and on the variations in food insecurity among the different groups. Migration and remittances are one of the crucial factors. A study has shown that a majority of the families of migrant labourers in Nepal largely rely on remittances for food purchases.[6] While this has had a positive impact on food security, there has also been reduced investment and engagement in the agriculture sector in the country, which has increased external reliance. The migrants' families, particularly in the rural areas, also rely on local shops for their food needs, which do not ensure food quality and competitive prices. Their bargaining capacity also becomes weak as they make payments for their food purchases often in bulk when they receive remittances from abroad, which can be months long. Hence, they lack access to better options.

The engagement of youth in agriculture is an important policy issue, including food security. Large-scale outmigration of the youth from the country has a close linkage with agriculture and food security. In Nepal, where agriculture is an important sector and where outmigration of youth has been increasing rapidly over the years, it is essential that there are policies in place to ensure that the nexus between migration and food security results in positive outcomes.

5 Ministry of Health and Population [Nepal], New ERA, and ICF, "Nepal Demographic and Health Survey 2022", 2023.
6 Yamuna Ghale, *Food Security Governance and Right to Food*, Adroit Publishers, 2022.

Policies, Strategies and Programmes on Food Security and Migration

Food security has always received high priority in Nepal as envisioned in the country's constitution and Nepal's acceptance of different international human rights frameworks. Similarly, the different policies, strategies and programmes of Nepal recognise migration as a human right of its citizens and consider remittances as a major source of the country's economy. However, there is a lack of policy that addresses the nexus between migration and food security.

Some of the policies, strategies and programme provisions in relation to migration and food security are briefly presented below:

- Article 36 of the Constitution of Nepal 2015 has provisions for food security, right to food and food sovereignty.

- The Agriculture Development Strategy (ADS) 2015-2035 states that the vision of the ADS is to develop Nepal's agriculture sector to be self-reliant, sustainable, competitive and inclusive would drive economic growth and contribute to improved livelihoods and food and nutrition security leading to food sovereignty. A challenge that was identified during the process of drafting the ADS was the large-scale outmigration of Nepali youth that would cause a labour shortage in agriculture.

A challenge that was identified during the process of drafting the ADS was the large-scale outmigration of Nepali youth that would cause a labour shortage in agriculture.

- The Right to Food and Food Sovereignty Act 2018 was promulgated with the aim to respect, protect and fulfil Nepali people's right to food. The Act specifies different provisions, including the Food Support Identity Card to the neediest families identified by the government.

- The Agri-business Policy 2006 aims to promote commercial agriculture by zoning agriculture areas into three parts: Commercial Crop/Commodity Production Area, Organic/ Pesticide-free Production Area and Agri Product Export Area.

- The mission statement of the Agri-mechanisation Policy 2014 mentions about modernisation of the agriculture sector through mechanisation for sustainable economic growth.

- The Directive on Grant Schemes for Encouraging Foreign Educated and Trained Youth in Agriculture, 2015 encourages the youth to enter into the agricultural sector in their home country and apply their capital, knowledge and skills.

There is a need for a policy that exclusively focuses on the nexus between migration and food security.

These constitutional provisions, policies, strategies and programmes provide examples of the government's efforts relating to food security, managing migration and making use of returnee migrants' capital, knowledge and skills, although not in an integrated manner. There is a need for a policy that exclusively focuses on the nexus between migration and food security. An important aspect of this would be strategies to better manage Nepali youth's outmigration.

Strategy to Deal with Migration

The existing trend of outmigration from Nepal is not a sustainable option for employment, income, economic growth and food security. A meaningful discourse on this issue is urgent and immediate. In this context, this paper proposes a 5-R strategy, namely, Retention, Return, Reintegration, Remittance management and Reversal of migration trends. The paper briefly discusses each of these in the following pages.

Retention

Retaining youth in the country is a major challenge as they struggle to find suitable and fair employment opportunities. The agriculture sector, in particular, is yet to be considered an attractive and sustainable source of employment among the young people in Nepal. Due to reduced options and choices that are aligned with the education they receive and the skills they have acquired, there is a lack of jobs for the youth in Nepal. On the other hand, there is a strong mismatch of the

youth's interests and competence with the human resources required in the job market.

To address these problems, the government must prepare a plan within the scope available in the country. Some of the existing provisions of the government, such as credit of up to NPR1.5 million (S$6,910) for women entrepreneurs, educated youth self-employment credit of NPR700,000 (S$3,230), Dalit community business development credit of up to NPR1 million (S$4,610), high skills technical education credit of NPR500,000 (S$2,305) and credit for returnee migrants of NPR1 million (S$4,610) need to be mobilised at a greater scale.[7] These provisions can certainly be an entry point to exercise the retention of the youth in the country, particularly in agriculture, which is the prime sector to attain food security objectives.

To address these problems, the government must prepare a plan within the scope available in the country.

Return

Outmigration from Nepal has been for various reasons by the different categories of the youth. For example, while well-educated and highly skilled youth have migrated, mostly permanently, for better career prospects, good income and better quality of life, the less educated and less skilled have migrated temporarily in search of basic jobs to help them meet their ends.

Different strategies are necessary to enable the return of high-skilled and educated youth. It might take a long time for this to happen. In the short to medium term, strategies are necessary to particularly target the return of temporarily migrated youth. Specifically, youth with additional knowledge, skills and capital that can be used in the agriculture sector could contribute immensely to food security.

Reintegration

Nepal's national programmes, projects and government budgets have accorded priority to returnee migrants. For example, the Prime

7 G Gurung, "Journalism and Entrepreneurship", 12 September 2020.

Minister Employment Programme, the Prime Minister Agriculture Modernisation Project and many projects funded by development partners have provisions to engage returning migrant workers.

In various fiscal years, targeted provisions were included in the national budgets, such as encouraging skilled returnee youth to engage in organic farming business (FY2019-20), COVID-19 impacted returnees to engage in various relevant sectors (FY2020-21), provision of concessional loans for small and medium enterprises, commercial agriculture and youth-led enterprises (FY2021-22). There is a need for societal appreciation and value for returnee youth in the country. They also need to be supported with social skills, redefined educational curricula and actualising apprentice programmes.

Remittance Management

In some cases, this leads to the youth falling back into the migration trap as their remittances do not become sources of sustained income back home.

Nepal's receipt of remittances is more than a fifth of its gross domestic product (GDP).[8] In many cases, the migrants' families back home have moved to cities and towns to provide better education to their children and enjoy relatively more comfortable lives. They spend a major share of their remittances on consumables, such as food items. Such a trend has diverted remittances from being invested in productive sectors such as agriculture, enterprises and businesses, among others. In some cases, this leads to the youth falling back into the migration trap as their remittances do not become sources of sustained income back home.

There is, therefore, a need to educate aspirant and returnee migrants, and their families in remittance management. To ensure that remittances are channelled into safe investments in productive sectors, the government has to create an enabling environment with the support of private sector actors.

5 Ministry of Finance, Government of Nepal, 2023.

Reversal of Migration

Nepal can also capitalise on sectors and domains where it has a relative advantage. This includes natural resources, promotion of cultural diversity and tourism, infrastructural development, information communication technology and more. Here, the ultimate aim of the government should be to reverse the trend of migration. The country will need additional technical human resources in other spheres for which Nepal can open job opportunities for experts from outside of Nepal if necessary.

The reversal of migration is, therefore, not beneficial only for the normal pace of development, but also extremely critical to cope with situations like COVID-19. The prosperity of the country thus ensures better productivity, employability and income opportunities that facilitate access to and affordability of food.

Conclusion

The current trend of migration is not a sustainable option for the country. Migration has a direct impact on the food security status of the population. Despite constitutional and other policy provisions, young people are not motivated to study or work in Nepal. Therefore, it is time for discourses that re-evaluate and work towards reversing trends in migration.

Despite constitutional and other policy provisions, young people are not motivated to study or work in Nepal.

The reversal of migration is necessary to optimise the potential of the country and to create employment and income for prosperity among its citizens. Young job seekers can be equipped through adaptive educational courses that impart required skills, while the government creates more conducive socio-cultural dynamics and broadens the scope for its young population. This will also ensure the establishment of people's right to food security as per the constitutional provision of the country.

A Broad-spectrum Analysis of Food Security in Pakistan

Muhammad Umar Farrukh, Muhammad Khalid Bashir and Sajjad Hyder

Introduction

Socioeconomic disparities in terms of income, health, ethnicity and education contribute to the increasing number of food-insecure households.

Pakistan is the fifth most populated country in the world with over 245 million people. Nearly half of the population in Pakistan suffers from multidimensional food insecurity.[1] Rural households struggle more with food access and affordability than urban households due to the massive rural-urban divide, natural calamities like floods and other factors like socioeconomic inequalities that contribute to food insecurity.[2] Sixty-two per cent of the people who reside in rural areas face extreme challenges of poverty and food insecurity.[3] Socioeconomic disparities in terms of income, health, ethnicity and education contribute to the increasing number of food-insecure households.[4]

Several empirical studies have demonstrated the linkages between socioeconomic inequalities along income, gender and health with poverty and food insecurity at the national and individual levels.[5] However, most of the existing research is narrow and scattered, and remains unidimensional in its focus on food security. For instance,

1 Food and Agriculture Organization, "The State of Food Security and Nutrition in the World 2022", 2022.

2 Muhammad Umar Farrukh, et al, "Dynamic effects of urbanization, governance, and worker's remittance on multidimensional food security: An application of a broad-spectrum approach", *Socio-Economic Planning Sciences*, *84*, 101400, 2022.

3 Nabila Khurshid and Emaan Abid, "Unraveling the complexity! Exploring asymmetries in climate change, political globalization, and food security in the case of Pakistan", Research in Globalization, 2024, https://www.sciencedirect.com/science/article/pii/S2590051X24000297.

4 Deyi Zhou, Tariq Shah, Sajjad Ali, Waqar Ahmad, Izhar Ud Din and Aasir Ilyas, "Factors affecting household food security in rural northern hinterland of Pakistan", *Journal of the Saudi Society of Agricultural Sciences, 18(2), 201-210*, 2019, https://www.sciencedirect.com/science/article/pii/S1658077X16301709; and Muhammad Umar Farrukh, et al, "Mapping the food security studies in India, Pakistan and Bangladesh: Review of research priorities and gaps", *Journal of Global Food Security, Volume 26*, September 2020.

5 Ali Ali and Dil Bahadur Rahut, "Localized floods, poverty and food security: empirical evidence from rural Pakistan", *Hydrology*, 7(1), 2, 2019; M Hussain, et al, "A comprehensive review of climate change impacts, adaptation, and mitigation on environmental and natural calamities in Pakistan", Environmental monitoring and assessment, 192, 1-20, 2020; and M U Farrukh, et al, "Exploring the sustainable food security approach in relation to agricultural and multi-sectoral interventions: a review of cross-disciplinary perspectives", *Geoforum*, 2020.

there is a plethora of existing literature focused on the food availability dimension.[6]

Food security is a broad concept that involves four key dimensions: food availability, food access or affordability, food utilisation and food stability over time.[7] The notion of 'food alone' has been recognised as a narrow approach to achieving food security.[8] Recent literature endorses adopting a broad-spectrum analysis for estimating the multifaceted aspects of food security.[9] Thus, this paper uses a broad-spectrum approach to review the multidimensional concept of food security in Pakistan.

Recent literature endorses adopting a broad-spectrum analysis for estimating the multifaceted aspects of food security.

A Broad-Spectrum Analysis

This paper systematically reviews the influence of eight diverse dimensions of socioeconomic inequality on food security in Pakistan (Figure 1). The sectoral analysis dimension reviews the role of the agricultural, manufacturing and services sectors in socioeconomic inequalities and their implications for food security. The income disparity dimension reviews the income inequalities across different sectors of the economy and their impact on household food security. The educational inequality dimension examines the impact of

6 Munir Ahmad and Umar Farooq, "The state of food security in Pakistan: Future challenges and coping strategies", *The Pakistan Development Review*, 903-923, 2010, https://www.jstor.org/stable/41428696; M K Bashir, et al, "The determinants of rural household food security in the Punjab, Pakistan: an econometric analysis", 2012; M K Bashir, et al, "Impact of socio-economic characteristics of rural households on food security: the case of the Punjab", 2013; M Kirby, et al, "Agricultural production, water use and food availability in Pakistan: Historical trends, and projections to 2050", *Agricultural Water Management*, 179, 34-46, 2017; and F Bukhari, et al "Consumers' purchase decision in the context of western imported food products: Empirical evidence from Pakistan", Heliyon, 9(10), 2023.

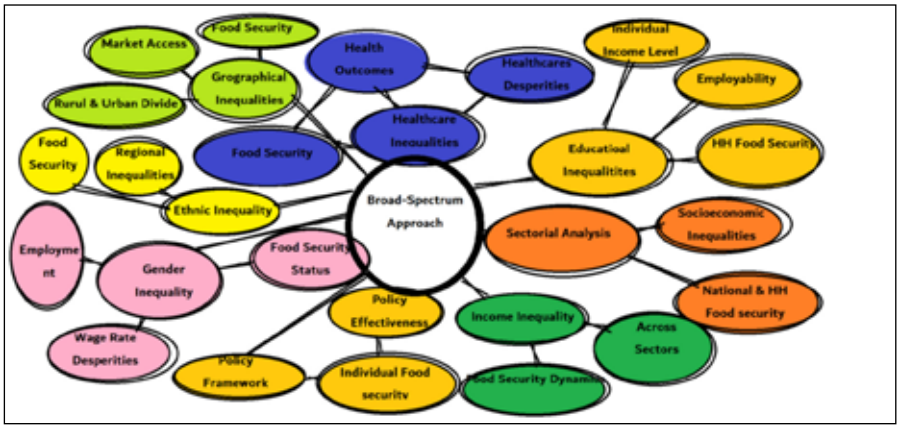
7 Muhammad Umar Farrukh, Muhammad Khalid Bashir, Sarfraz Hassan, Sultan Ali Adil, and Marit E Kragt, "Mapping the food security studies in India, Pakistan and Bangladesh: Review of research priorities and gaps", *Journal of Global Food Security. Volume 26*, September 2020, https://www.sciencedirect.com/science/article/pii/S2211912420300237.

8 Muhammad Umar Farrukh, Muhammad Khalid Bashir, Sarfraz Hassan, Sultan Ali Adil and Marit E Kragt, "Mapping the food security studies in India, Pakistan and Bangladesh: Review of research priorities and gaps", *Journal of Global Food Security. Volume 26*, September 2020, https://www.sciencedirect.com/science/article/pii/S2211912420300237; and Noshaba Aziz, Qasim Ali Nisar, Mansoor Ahmed Koondhar, Muhammad Saeed Meo and Kong Rong, "Analysing the women's empowerment and food security nexus in rural areas of Azad Jammu & Kashmir, Pakistan: By giving consideration to sense of land entitlement and infrastructural facilities", Land Use Policy, 94, 2020, https://www.sciencedirect.com/science/article/pii/S0264837719321106.

9 Muhammad Umer Farrukh, Muhammad Khalid Bashir and Fay Rola-Rubzen, "Exploring the sustainable food security approach in relation to agricultural and multi-sectoral interventions: a review of cross-disciplinary perspectives", *Geoforum*. 2020, https://www.sciencedirect.com/science/article/pii/S0016718519303306; and N Hayat, et al, "Households' food consumption pattern in Pakistan: Evidence from recent household integrated economic survey", *Heliyon*, 2023.

education disparities on household income levels and individual employability and subsequent effects on food security.

Figure 1: Broad-Spectrum Analysis



Source: Authors.

There is also an ethnic dimension to food insecurity in Pakistan.

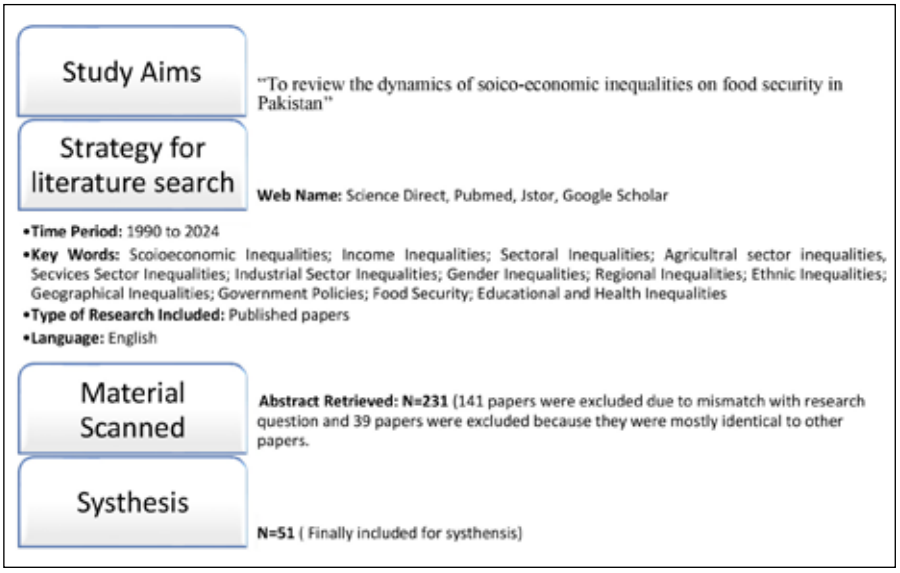
The health inequality dimension scrutinises the disparities in healthcare services and health outcomes and their influence on food security. The gender inequality dimension reviews the effect of gender disparities in wage rates, employability and social well-being on individual and household security. The geographical inequality dimension studies the role of regional disparities such as market access, infrastructure and the rural-urban divide on food security. There is also an ethnic dimension to food insecurity in Pakistan. The policy dimension scrutinises the effectiveness of governmental policies in addressing socioeconomic inequalities and achieving food security. The crucial purpose of framing the broad-spectrum approach is to examine the deeper dynamics of socioeconomic inequalities on food security outcomes and improve the effectiveness of food security policy formulation.

Methodology

This paper implements a systematic review analysis of the available literature on socioeconomic inequalities and food security in Pakistan. This review method uses a transparent system of search protocols

to document each step of the study process. We comprehensively reviewed existing research papers to offer a snapshot of the literature on socioeconomic inequalities and food security, identifying which inequality dimensions are well-reported and which need supplementary research in the future. The details of the literature screening process are presented in Figure 2.

Figure 2: Systematic Scanning Process



Source: Authors.

This study follows the framework developed by the United Kingdom government's Department for International Development.[10] This framework provides a transparent, unbiased and robust process for identifying and assembling relevant research papers. We included the identified papers based on external and internal validity, criteria that are neglected in country-specific review processes.[11]

This study follows the framework developed by the United Kingdom government's Department for International Development.

[10] Department for International Development, "How to Note: Assessing the Strength of Evidence", 2014, https://www.gov.uk/ government/publications/how-to-note-assessing-the-strength-of-evidence.

[11] Suneetha Kadiyala, Jody Harris, Derek Headey, Sivan Yosef and Stuart Gillespie, "Agriculture and nutrition in India: mapping evidence to pathways", *Annals of the New York Academy of Sciences*, 2014, https://nyaspubs.onlinelibrary.wiley.com/doi/abs/10.1111/nyas.12477; and Muhammad Umer Farrukh, Muhammad Khalid Bashir, and Fay Rola-Rubzen, "Exploring the sustainable food security approach in relation to agricultural and multi-sectoral interventions: a review of cross-disciplinary perspectives", *Geoforum*, 2020, https://www.sciencedirect.com/science/article/pii/S0016718519303306.

Results

Sectoral Analysis and Food Security

Small agricultural landholders face significant problems in accessing markets, agricultural inputs, technology and financial credit.

Understanding Pakistani people's access to resources, employment opportunities, incomes and vulnerability in these factors in the agriculture, industry and services sectors is important to analyse the state of food insecurity in Pakistan.[12] In the agriculture sector, socioeconomic inequalities are high in Pakistan due to unequal land holdings and distribution.[13] Small agricultural landholders face significant problems in accessing markets, agricultural inputs, technology and financial credit. This exacerbates their socioeconomic vulnerability and adversely affects their food and nutritional security status.[14] Moreover, extreme weather events like floods and heatwaves, aggravated by climate change, threaten rural households' economic livelihoods and agricultural productivity, further exacerbating food insecurity in Pakistan.[15]

The manufacturing sector has helped stimulate real economic growth and urbanisation, but it has also increased socioeconomic inequality.[16] It has been found that the urbanised regions of Pakistan with greater industrial activity are more food secure compared to rural areas that largely rely on the agriculture sector.[17] Many studies claim that a paradigm shift from an agro-based economy to industrialisation

12 Muhammad Bashir, Steven Schilizzi and R pandit, "Livestock and Rural Household Food Security: The Case of Small Farmers of the Punjab, Pakistan", 2012, https://www.academia.edu/download/67406251/Livestock_and_Rural_Household_Food_Secur20210523-30025-n126lz.pdf; and "Highlights of Pakistan Economic Survey 2022-23", Economic Adviser's Wing, Finance Division, Government of Pakistan, 2023.

13 Umar Ijaz Ahmed, Liu Ying, Muhammad Khalid Bashir, Muhammad Abid, and Farhad Zulfiqar, "Status and determinants of small farming households' food security and role of market access in enhancing food security in rural Pakistan", *PloS one*, 2017, https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0185466.

14 Hafiz Asim and Muhammad Akbar, "Sectoral growth linkages of agricultural sector: Implications for food security in Pakistan", *Agricultural Economics/Zemedelska Ekonomika*, 2019, http://www.agriculturejournals.cz/pdfs/age/2019/06/04.pdf.

15 Claudia Ringler and Arif Anwar, "Water for food security: challenges for Pakistan", Water international, 2013, https://www.tandfonline.com/doi/abs/10.1080/02508060.2013.832122; Abdullah Kamal, Muhammad Kamal Sheikh, Bismah Azhar, Muhammad Munir, Mirza Barjees Baig and Michael R. Reed, "Role of agriculture extension in ensuring food security in the context of climate change: State of the art and prospects for reforms in Pakistan", Food Security and Climate-Smart Food Systems: Building Resilience for the Global South, 2022, https://link.springer.com/chapter/10.1007/978-3-030-92738-7_10.

16 Hafiz Asim and Muhammad Akbar, "Sectoral growth linkages of agricultural sector: Implications for food security in Pakistan", op. cit.

17 Nadia Asghar and Aneel Salman, "Impact of agriculture credit on food production and food security in Pakistan", Pakistan Journal of Commerce and Social Sciences, 2018, https://www.econstor.eu/handle/10419/193450.

has enhanced the income and well-being of some but left many, especially people living in rural areas, more vulnerable to poverty and food insecurity due to low economic opportunities and inadequate social safety nets.[18]

Within the services sector, which contributes almost 58 per cent to Pakistan's gross domestic product, growth is not evenly distributed.[19] Urban areas receive greater benefits from the growth of the services sector, while peri-urban and rural areas lag behind, further worsening socioeconomic inequalities and food security.[20] The growth of the services sector, including health, education and finance, has great potential to achieve inclusive food security by enhancing individuals' and households' income levels and service standards, but only if macroeconomic policies ensure distributional justice across the regions.[21]

Urban areas receive greater benefits from the growth of the services sector, while peri-urban and rural areas lag behind, further worsening socioeconomic inequalities and food security.

Income Disparities and Food Security

Food insecurity in Pakistan is also a result of the skewed distribution of land holdings, inadequate availability of job opportunities and unequal access to economic resources. About 62 per cent of the total labour force is employed in the agriculture sector, and since income from agriculture is relatively less than that in other economic sectors, there are stark income differentials.[22] The urban residents receive more benefits from economic growth compared to rural residents because of the former's dependence on the manufacturing

18 Sana Iftikhar, Hina Amir, Zunaira Khadim and Kanwal Bilal, "Farmer's Literacy Rate as Key Driver in Food Production and Food Security: An Empirical Appraisal from Punjab, Pakistan", *European Online Journal of Natural and Social Sciences*, 2015, https://core.ac.uk/download/pdf/296307423.pdf; Muhammad K Bashir and Steven Schilizzi, "Food security policy assessment in the Punjab, Pakistan: effectiveness, distortions and their perceptions", Food Security, 2015, https://link.springer.com/article/10.1007/s12571-015-0489-y; and Sohail Abbas, Shazia Kousar and Mahr Sahibzad Khan, "The role of climate change in food security; empirical evidence over Punjab regions, Pakistan", *Environmental Science and Pollution Research*, 29(35), 2022.

19 Hafiz Asim and Muhammad Akbar, "Sectoral growth linkages of agricultural sector: Implications for food security in Pakistan", *Agricultural Economics/Zemedelska Ekonomika*, 2019, http://www.agriculturejournals.cz/pdfs/age/2019/06/04.pdf.

20 Muhammad Akbar and Abdul Jabbar, "Impact of macroeconomic policies on national food security in Pakistan: simulation analyses under a simultaneous equations framework", *Agricultural Economics/Zemědělská Ekonomika*, 2017, https://agricecon.agriculturejournals.cz/pdfs/age/2017/10/04.pdf.

21 Hafiz Asim, "Food Security Analysis in Pakistan: A Multi-Indicator Approach", *Kashmir Economic Review*, 27(1), 2018, https://ker.org.pk/index.php/ker/article/view/105.

22 "Highlights of Pakistan Economic Survey 2022-23", Economic Adviser's Wing, Finance Division, Government of Pakistan, 2023.

and services sectors. This has worsened regional disparities in Pakistan.[23] Such income disparities have an adverse impact on food access and affordability, particularly for low-income quintiles and poorer households.[24] A more recent study highlighted that non-farm incomes play a substantial role in the mitigation of the adverse effects of income disparities in Pakistan's rural areas.[25]

Educational Inequality and Food Security

The higher education level of the members of a household positively impacts the household's food security.

Educational inequalities are a crucial factor of underdevelopment and socioeconomic inequalities in Pakistan.[26] There are enormous gaps in the availability and access of quality education between rural and urban areas in Pakistan. This perpetuates the limited access to economic opportunities and food insecurity of vulnerable groups. A recent study has highlighted that inadequate access to education worsens the level of socioeconomic inequalities.[27] In the same vein, there are studies that have found that educational accomplishments are positively correlated with food security. The higher education level of the members of a household positively impacts the household's food security.[29] Similarly, evidence also indicates that inequality in education and opportunities in the job market adversely affect food security, especially for women.[30]

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23 Haroon Yousaf, Muhammad Usman Zafar, Muhammad Omar Zafar, Shabbir Ahmad and Qazi Ahmad Raza, "Regional distribution of food security and its determinants across regions of the Punjab, Pakistan", *Pakistan Journal of Agricultural Sciences*, 2018, https://www.academia.edu/download/65539919/REGIONAL_DISTRIBUTION_OF_FOOD_SECURITY_AND_ITS_DETERMINANTS_ACROSS_REGIONS_OF_THE_PUNJAB_PAKISTAN.pdf.

24 Adeeba Ishaq, Mahmood Khalid and Eatzaz Ahmad, "Food insecurity in Pakistan: A region-wise analysis of trends", Pakistan Institute of Development Economics (PIDE) Working Papers, 157, 2018, https://file.pide.org.pk/pdf/Working%20Paper/WorkingPaper-157.pdf.

25 Touqeer Ahmad and Abdul Saboor, "Food Security in Pakistan and Need for Public Policy Adjustments". *Policy Perspectives*, 19(2), 2022, https://www.jstor.org/stable/48734162.

26 Ahmed Raza Cheema, et al, "Role of education, age, and family size on food insecurity in Pakistan: A quantile regression analysis", *The European Journal of Development Research*, 34(5), 2022, https://link.springer.com/article/10.1057/s41287-021-00479-w.

27 Rukhsana Rasheed, Mazhar Nadeem Ishaq and Muhammad Akbar, "A correlation of socio-economic determinants and food security status in Pakistan", *Pakistan Journal of Humanities and Social Sciences*, 10(1), 2022.

28 Ahmed R Cheema and Zafar Abbas, "Determinants of food insecurity in Pakistan: evidence from PSLM 2010-11", *Pakistan Journal of Applied Economics*, 26(2), 183-213, 2022, https://www.academia.edu/download/79911912/Paper-679-IV-AHMED-RAZA-1.pdf; Mariam A Soharwardi, Saleem Ashraf, Hafiz Amjad Ali Rana, Wajiha Shahid, Naima Nawaz and Ijaz Ashraf, "Empowering Food Security: The Role of Education in Alleviating Poverty in Developing Countries – A Case Study of Pakistan", *Jammu Kashmir Journal of Agriculture*, 3(3), 271-181, 2023, http://jkjagri.com/index.php/journal/article/view/102.

29 Abeeda Ishaq, Mahmood Khalid and Eatzaz Ahmad, "Food insecurity in Pakistan: A region-wise analysis of trends", Pakistan Institute of Development Economics (PIDE) Working Papers, 157, 1-26, 2018, https://file.pide.org.pk/pdf/Working%20Paper/WorkingPaper-157.pdf.

30 Sana Iftikhar and Hafiz Z Mahmood, "Spatial distribution of agricultural resources and food security: A case of Punjab Pakistan", Cogent Food & Agriculture, 3(1), 2017, https://www.tandfonline.com/doi/abs/10.1080/23311932.2017.1357265.

Regional inequalities in education are also important factors in examining the socioeconomic disparities and food insecurity.[31] Rural areas in Pakistan lack basic educational infrastructure, which results in low educational outcomes in those areas and high food insecurity.[32]

Health Inequality and Food Security

Health inequalities, which are caused by several factors like education, income level, demography and access to healthcare services, result in socioeconomic inequalities.[33] These socioeconomic inequalities have adverse implications for food and nutritional security outcomes. Existing studies illustrate that households with poor health status are more inclined to experience food insecurity due to high healthcare costs and low-income capacity.[34] This creates a need for social safety nets that mitigate socioeconomic and health inequalities at the household levels.[35]

This creates a need for social safety nets that mitigate socioeconomic and health inequalities at the household levels.

Child and maternal health-related challenges are exacerbated by health inequalities in Pakistan.[36] Food insecurity related to maternal health is marked as the intergenerational transformation of food and nutritional insecurity.[37] There is a need for socioeconomic policies that expand women's empowerment, health, and food security.[38]

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31 Sana Iftikhar, Hina Amir, Zunaira Khadim and Kanwal Bilal, "Farmer's Literacy Rate as Key Driver in Food Production and Food Security: An Empirical Appraisal from Punjab, Pakistan", op. cit.

32 Deyi Zhou, Tariq Shah, Sajjad Ali, Waqar Ahmad, Izhar Ud Din and Aasir Ilyas, "Factors affecting household food security in rural northern hinterland of Pakistan", *Journal of the Saudi Society of Agricultural Sciences*, 18(2), 201-210, 2019, https://www.sciencedirect.com/science/article/pii/S1658077X16301709.

33 Hina Ali and Fouzia Yasmin, "Food Security in Pakistan: Analyzing the Role of State in Providing Healthy Food", *Scientific Journal of Mehmet Akif Ersoy University*, 2(4), 90-101, 2019, https://dergipark.org.tr/en/pub/sjmakeu/issue/51356/667777.

34 Muhammad Masood Azeem, Amin W Mugera and Steven Schilizzi, "Living on the edge: Household vulnerability to food-insecurity in the Punjab, Pakistan", *Food Policy*, 64, 1-13, 2016, https://www.sciencedirect.com/science/article/pii/S0306919216302767.

35 Touqeer Ahmad and Abdul Saboor, "Food Security in Pakistan and Need for Public Policy Adjustments", *Policy Perspectives*, 19(2), 89-122, 2022, https://www.jstor.org/stable/48734162.

36 Sana Khushi, Sajid Rashid Ahmad, Ather Ashraf and Muhammad Imran, "Spatially analyzing food consumption inequalities using GIS with disaggregated data from Punjab, Pakistan: Analyzing food patterns in Punjab using disaggregated data with GIS", *Food Security*, 12, 1283-1298, 2020, https://link.springer.com/article/10.1007/s12571-020-01057-4.

37 Abdul Hameed, Ihtsham Ul Haq Padda and Abdul Salam, "Analysis of Food and Nutrition Security in Pakistan: A Contribution to Zero Hunger Policies", *Sarhad Journal of Agriculture*, 37(3), 2021, https://www.researchgate.net/profile/Abdul-Hameed-36/publication/353275981_Analysis_of_Food_and_Nutrition_Security_in_Pakistan_A_Contribution_to_Zero_Hunger_Policies/links/61079357169a1a0103cf854e/Analysis-of-Food-and-Nutrition-Security-in-Pakistan-A-Contribution-to-Zero-Hunger-Policies.pdf.

38 Mariachiara Di Cesare, Zaid Bhatti, Sajid B Soofi, Lea Fortunato, Majid Ezzati and Zulfiqar A Bhutta, "Geographical and socioeconomic inequalities in women and children's nutritional status in Pakistan in 2011: an analysis of data from a nationally representative survey", The Lancet Global Health, 3(4), e229-e239, 2015, https://www.thelancet.com/journals/langlo/article/PIIS2214-109X(15)70001-X/fulltext.

Gender Inequality and Food Security

Evidence also shows that households with more gender equality in terms of decision-making and economic resources are more food secure in both rural and urban areas.

Gender inequality is pervasive, more specifically in the rural areas across Pakistan, where women have limited access to healthcare services, educational facilities and socioeconomic opportunities.[39] Such inequalities confine women's socioeconomic contribution and worsen inclusive food security.[40] A recently published study has shown how gender discrimination adversely affects women's food security in rural areas of Pakistan.[41] Evidence also shows that households with more gender equality in terms of decision-making and economic resources are more food secure in both rural and urban areas.[42] Similarly, women empowerment, particularly in agriculture, can improve the food and nutritional status by managing available resources more efficiently.[43]

Geographical Inequalities and Food Security

Geographical disparities are the result of inequalities in infrastructure, ecological factors, and access to resources. Such inequalities have adversely affected the food security of vulnerable groups in Pakistan.[44] Usually, geographical inequalities are manifested in Pakistan through uneven developmental patterns across different provinces and subregions.[45] Urban regions tend to have access to better education and healthcare infrastructure relative to rural regions in

39 Noshaba Aziz Yanjun Ren, Kong Rong and Jin Zhou, "Women's empowerment in agriculture and household food insecurity: Evidence from Azad Jammu & Kashmir (AJK), Pakistan", Land Use Policy, 2021, https://www.sciencedirect.com/science/article/pii/S0264837720325874.

40 N H Broussard, "What explains gender differences in food insecurity?", *Food Policy*, 83, 180-194, 2019.

41 Azka Rehman, Qing Ping and Amar Razzaq, "Pathways and associations between women's land ownership and child food and nutrition security in Pakistan", *International Journal of Environmental Research and Public Health*, 16(18), 3360, 2019, https://www.mdpi.com/1660-4601/16/18/3360.

42 Muhammad Akbar, Rizwan Niaz and Muhammad Amjad, "Determinants of households' food insecurity with severity dimensions in Pakistan: Varying estimates using partial proportional odds model", Health & Social Care in the Community, 28(5), 1698-1709, 2020, https://onlinelibrary.wiley.com/doi/abs/10.1111/hsc.12995.

43 Bina Agarwal, "Gender equality, food security and the sustainable development goals", *Current Opinion in Environmental Sustainability*, 34, 26-32, 2018, https://www.sciencedirect.com/science/article/pii/S1877343517302415.

44 Ayesha Parveen, Saira Tufail and Verda Salman, "Impact of Demographic Vulnerabilities and Socio-Economic Resilience on Food Insecurity in Pakistan", *Journal of Asian and African Studies*, 59(4), 1054-1077, 2024, https://journals.sagepub.com/doi/abs/10.1177/00219096221130349.

45 Faisal Munir, Sohail Ahmad, Sami Ullah and Ya Ping Wang, "Understanding housing inequalities in urban Pakistan: An intersectionality perspective of ethnicity, income and education", *Journal of Race, Ethnicity and the City*, 3(1), 1-2, 2022, https://www.tandfonline.com/doi/abs/10.1080/26884674.2021.1986442.

Pakistan.[46] The urban-rural divide in Pakistan is more intensified due to poor access to agricultural inputs and markets in rural regions.[47] Geographical factors, including limited water resources and frequent droughts, also contribute to chronic food insecurity in rural areas.[48] A study revealed that geographical regions with extreme environments and those prone to natural hazards were more vulnerable to food insecurity.[49] Another study emphasised the dire need for an inclusive policy framework that can mitigate the effects of political instability and climate change on food security, particularly in rural areas in Pakistan.[50] Hence, enhancing the agricultural inputs market, developing the rural infrastructure, and improving the water use efficacy and management systems are prerequisites for reducing geographical and regional inequalities and promoting food security.[51]

The urban-rural divide in Pakistan is more intensified due to poor access to agricultural inputs and markets in rural regions.

Public Policy and Food Security

Public policy plays a crucial role in addressing food insecurity and socioeconomic inequalities, particularly by shaping income distribution, economic landscape and resource availability.[52] Economic policies, such as structural adjustment programmes, have adversely affected the marginalised groups in Pakistan.[53] Studies have found that liberal trade and economic policies pursued by Pakistan

46 Nadia Akseer, Zaid Bhatti, Taufiq Mashal, Sajid Soofi, Rahim Moineddin, Robert E Black and Zulfiqar A Bhutta, "Geospatial inequalities and determinants of nutritional status among women and children in Afghanistan: an observational study", The Lancet Global Health, 6(4), e447-e459, 2018, https://www.thelancet.com/journals/langlo/article/PIIS2214-109X(18)30025-1/fulltext?%7B$trackingTag%7D=.

47 Nauman Ejaz and Thilak Mallawaarachchi, "Disparities in economic achievement across the rural–urban divide in Pakistan: Implications for development planning", *Economic Analysis and Policy*, 77, 487-512, 2023.

48 Kate Sinclair, Davod Ahmadigheidari, Diana Dallmann, Meghan Miller and Hugo Melgar-Quiñonez, "Rural women: Most likely to experience food insecurity and poor health in low-and middle-income countries", *Global Food Security*, 23, 104-115, 2019, https://www.sciencedirect.com/science/article/pii/S2211912418301093.

49 Mohammad Qasim Sodhar, "Population Growth and Inter-Provincial Economic Disparity: Two Major Factors Behind the Underdevelopment of Pakistan", *Sociology of Islam*, 7(2-3), 148-164, 2019, https://brill.com/view/journals/soi/7/2-3/article-p148_148.xml.

50 Rafy Amir-ud-Din, Sakina Fawad, Lubna Naz, Sameen Zafar, Ramesh Kumar and Sathirakorn Pongpanich, "Nutritional inequalities among under-five children: a geospatial analysis of hotspots and cold spots in 73 low-and middle-income countries", *International Journal for Equity in Health*, 21(1), 135, 2022, https://link.springer.com/article/10.1186/s12939-022-01733-1.

51 Muhammad T I Khan, Sofia Anwar and Zahira Batool "The role of infrastructure, socio-economic development and food security to mitigate the loss of natural disasters", *Environmental Science and Pollution Research*, 29(35), 52412-52437, 2022, https://link.springer.com/article/10.1007/s11356-022-19293-w.

52 Touqeer Ahmad and Abdul Saboor, "Food Security in Pakistan and Need for Public Policy Adjustments", Policy Perspectives, 19(2), 89-122, 2022; and M Akbar and A Jabbar, "Impact of macroeconomic policies on national food security in Pakistan: simulation analyses under a simultaneous equations framework", *Agricultural Economics/Zemědělská Ekonomika*, 63(10), 2017.

53 IPCC, "Food Security – Special Report on Climate Change and Land", 2023.

have often led to increased food inflation.[54] The lack of access to social safety nets has further aggravated the food insecurity of marginalised groups.[55] Pakistani households with less socioeconomic resilience are more vulnerable to becoming food insecure.[56] This highlights the requirement for inclusive policies that address both social and economic problems. Additionally, addressing challenges such as corruption and governance issues is critical for managing the problems of socioeconomic inequalities and food insecurity.

Ethnic and Regional Inequalities and Food Security

Additionally, ethnic and regional inequalities result in food insecurity, poverty and limited economic opportunities in Pakistan.

Ethnic and regional inequalities have many faces in Pakistan.[57] Many ethnic groups, for instance, Sindhi, Balochi and Siraiki face widespread marginalisation within the country and these marginalised groups are deprived of adequate housing and vital civil rights.[58] This has implications for food security and socioeconomic vulnerabilities.[59] Additionally, ethnic and regional inequalities result in food insecurity, poverty and limited economic opportunities in Pakistan.[60] Another study highlighted that the primary cause of regional inequalities is an uneven distribution of government resources and developmental projects.[61] The minority ethnic groups in Pakistan are more vulnerable to food insecurity in rural areas as compared to urban areas.[62] In

54 Shakeel Ahmad Ramay, "State of Food Security in Pakistan and Policy Options", Sustainable Development Policy Institute, 2016, https://www.academia.edu/download/78874557/State-of-Food-Security-in-Pakistan-and-Policy-Options.pdf.

55 Sara Rizvi Jafree, "Food Security, Nutrition and Social Policy for Women of Pakistan", *Social Policy for Women in Pakistan*, Springer Nature Switzerland, 2023, https://link.springer.com/chapter/10.1007/978-3-031-32863-3_4.

56 Akhter Ali, Dil Bahadur Rahut and Khondoker Abdul Mottaleb, "Improved water-management practices and their impact on food security and poverty: empirical evidence from rural Pakistan", *Water Policy*, 20(4), 692-711, 2018.

57 Sana Khushi, Sajid Rashid Ahmad, Ather Ashraf and Muhammad Imran, "Spatially analyzing food consumption inequalities using GIS with disaggregated data from Punjab, Pakistan. Analyzing food patterns in Punjab using disaggregated data with GIS", *Food Security*, 12, 1283-1298, 2020.

58 Ayesha Parveen, Saira Tufail and Verda Salman, "Impact of Demographic Vulnerabilities and Socio-Economic Resilience on Food Insecurity in Pakistan", *Journal of Asian and African Studies*, 59(4), 1054-1077, 2024.

59 Nauman Ejaz and Thilak Mallawaarachchi, "Disparities in economic achievement across the rural–urban divide in Pakistan: Implications for development planning", *Economic Analysis and Policy*, 77, 487-512, 2023.

60 Abid Q Suleri and Mehreen Iqbal, "National food security challenges and strategies in Pakistan: cooperation for technology and trade", *Regional Cooperation for Sustainable Food Security in South Asia* (pp. 211-226). Routledge India, 2019, https://www.taylorfrancis.com/chapters/edit/10.4324/9780429346507-9/national-food-security-challenges-strategies-pakistan-abid-qaiyum-suleri-mehreen-iqbal.

61 Furqan Sikandar, Hongshu Wang, Kanwal Zahra, Muhammad Zada and Muhammad Usman Mumtaz, "Effects of Poverty Reduction Policies on Food Security and Sustainable Development in Rural Areas: Case of Southern Punjab, Pakistan", *Shifting Patterns of Agricultural Trade: The Protectionism Outbreak and Food Security*, 2021, https://link.springer.com/chapter/10.1007/978-981-16-3260-0_23.

Tharparker, a city in Sindh province, ethnic and regional inequalities are deepened by climatic challenges and socioeconomic inequalities, leading to chronic food and nutritional insecurity at regional, household and individual levels.[63] Social disparities were the triggering factors for high food insecurity in the rural areas of Pakistan.[64]

Concluding Remarks

This study concludes that food insecurity in Pakistan is a result of multidimensional factors. The sectoral analysis of the agriculture, manufacturing and services sectors indicates significant disparities within these sectors. Rural areas, with unequal land holdings and limited access to resources, face more barriers to socioeconomic upliftment. A considerable number of the labour force remaining in low-income agriculture-based activities aggravates income inequality and, hence, food insecurity. Similarly, educational disparities further extend the rural socioeconomic vulnerabilities, limiting the rural populace's potential and opportunities for getting better jobs. This aggravates food insecurity at both individual and household levels in Pakistan. Health and gender related disparities are correlated with food and nutritional insecurity, with marginalised groups bearing higher healthcare costs, lower food diversity and utilisation outcomes. Analysis of ethnic and regional disparities also indicates the deep marginalisation of those who are landless and those belonging to minority groups in rural and peri-urban areas. Additionally, the uneven distribution of resources among these marginalised groups increases food security vulnerabilities in regions like Tharparker. Geographical inequalities engendered by limited socioeconomic infrastructure and environmental challenges further hamper food and nutritional security outcomes. An effective public policy has a significant role in mitigating these socioeconomic disparities in both urban and rural

Health and gender related disparities are correlated with food and nutritional insecurity, with marginalised groups bearing higher healthcare costs, lower food diversity and utilisation outcomes.

62 Dilshad Ahmad and Muhammad Afzal, "Flood hazards, human displacement and food insecurity in rural riverine areas of Punjab, Pakistan: policy implications", Environmental Science and Pollution Research, 28(8), 10125-10139, 2021, https://link.springer.com/article/10.1007/s11356-020-11430-7.

63 Aisha Shahzad, "Issues of Ethnic Diversity and Just Development in Pakistan with a Special Focus on the Seraiki Ethnic Group", *Pakistan Perspectives*, 24(1), 2019, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3549159.

64 Muhammad Mushtaq and Zahra S Mirza, "Understanding the nexus between horizontal inequalities, ethno-political conflict and political participation: A case study of Balochistan", Ethnopolitics, 21(3), 221-237, 2022, https://www.tandfonline.com/doi/abs/10.1080/17449057.2021.1920734.

areas in Pakistan. Yet, existing public policies have often failed to address the root causes of social disparities and food insecurity.

This translates to expanding rural infrastructure to ensure equitable distribution and increase access to healthcare and education services in Pakistan.

Our findings endorse the need for inclusive and comprehensive policy frameworks. This translates to expanding rural infrastructure to ensure equitable distribution and increase access to healthcare and education services in Pakistan. Additionally, there is a need to address ineffective governance and corruption-related issues to improve food security outcomes. Finally, this study concludes that Pakistan should adopt a broad-spectrum approach to understand the multi-dimensional nature of food security in the country. It should adopt an inclusive policy framework to cope with the identified challenges and ensure food security for its people who have been left behind.

Food Security in Sri Lanka in the Aftermath of the Abrupt Policy Change Towards Organic Agriculture

Manoj Thibbotuwawa

Introduction

In 2021, Sri Lanka introduced and eventually backtracked on a controversial policy on chemical fertilisers. On 6 May 2021, the Sri Lankan government imposed a ban on imports of chemical fertilisers through the Imports and Exports (Control) Regulation No 07 of 2021. The ban was aimed at shifting conventional farming entirely to organic farming and making Sri Lanka the first country to achieve 100 per cent organic status globally. This policy was guided by the government's responsibility to ensure the right of Sri Lankan consumers to access safe and nutritious food of good quality. Another reason for the ban, according to anecdotal evidence, was the easing of the foreign exchange burden.[1]

This policy was guided by the government's responsibility to ensure the right of Sri Lankan consumers to access safe and nutritious food of good quality.

This policy did not last long. Stiff opposition from different stakeholders, particularly farmers, because of the challenges they faced with the lack of fertilisers during the Maha season in 2022 compelled the government to replace the import ban with a licence requirement on 31 July 2021. Eventually, on 30 November 2021, the ban was revoked.[2] Despite the removal of the ban, Sri Lanka seems to have experienced a severe shortage of fertilisers due to various domestic and global issues, which affected agriculture and food security within the country.

1 Jeevika Weerahewa, et al, "Reforming fertilizer import policies for sustainable intensification of agricultural systems in Sri Lanka: Is there a policy failure?", PRCI Policy Research Notes 3, East Lansing, MI: Michigan State University, 2021, https://www.canr.msu.edu/prci/publications/Policy-Research-Notes/PRCI_PRN_3.pdf.

2 Sachini Niwarthana, N. Dissanayake, Manoj Thibbotuwawa and H S R Rosairo, "The Impact of Chemical Fertilizer Ban on the Paddy Sector: Propensity Score Matching and Value Chain Analysis", Research Paper #21, Feed the Future, Michigan State University, September 2023, https://www.canr.msu.edu/prci/publications/SJAE_Sachini_2023_final_sept_20%20edited%202.pdf.

The agriculture sector also plays a critical role in alleviating poverty and food insecurity in the country.

Agriculture is an important part of the socio-economy of Sri Lanka, contributing significantly to economic growth and exports while providing livelihood to a considerable proportion of its people. In 2022, the agriculture sector accounted for 7.5 per cent of the country's gross domestic product (GDP) and employed more than a quarter (26.5 per cent) of the country's labour force (2.2 million people).[3] The agriculture sector also plays a critical role in alleviating poverty and food insecurity in the country.

The total land area under cultivation in Sri Lanka is 2.372 million hectares, equivalent to 36 per cent of the country's total land area.[4] Paddy farming has been the main component of agricultural livelihoods since ancient times, providing occupation for a significant share of the rural population in the country.[5] At present, 74 per cent of Sri Lanka's annual food requirement is produced domestically, and only 26 per cent is imported.[6] Therefore, the food security situation in Sri Lanka depends primarily on the rice and other domestic crop sectors' performance.

Against this backdrop, this paper aims to analyse the food security situation in Sri Lanka in the aftermath of the chemical fertiliser ban. It mainly focuses on food availability and access to food which are the two major components of food security that are related to the agriculture sector.

Overview of Food Security in Sri Lanka

As stated in the Food and Agriculture Organization of the United Nations (FAO) Draft Declaration of the World Summit on Food Security 2009, food security exists "when all people at all times have physical, social and economic access to sufficient, safe and nutritious food which meets their dietary needs and food preferences for an active

3 Central Bank of Sri Lanka, "Annual Report", 223, https://www.cbsl.gov.lk/en/publications/economic-and-financial-reports/annual-reports; and Department of Census and Statistics of Sri Lanka, "Labour Force Survey Annual Report 2022", 2023, http://www.statistics.gov.lk/LabourForce/StaticalInformation/AnnualReports/2022.

4 Food and Agriculture Organization, "FAOSTAT", 2024, https://www.fao.org/faostat/en/#country/38.

5 Manoj Thibbotuwawa, "Building Resilient Agricultural Value Chains during COVID-19", IPS (eds), SOE Report 2021, Institute of Policy Studies, 2021.

6 Food and Agriculture Organization, "FAOSTAT", 2024, http://www.fao.org/faostat/en/#data/FS.

and healthy life". This definition covers the four main aspects – food availability, food access, food stability and food utilisation – that are important to ensure the food and nutrition security of an individual. A distinction is made between transitory and chronic food insecurity in designing policies to address food insecurity.[7] Chronic food insecurity arises due to a continuously inadequate diet associated with longer-term issues such as poverty, but transitory food insecurity is associated with short-term shocks related to off-seasons, extreme climatic conditions such as drought and floods, and pandemics such as COVID-19.

According to the Global Food Security Index, Sri Lanka's rank and score have gradually worsened since 2019, indicating a decline in food security performance. Despite the slight increase in the score from 2021 to 2022, the rank has declined from 77th to 79th, indicating poor relative performance of the food security situation of the country. According to an FAO report, food and nutrition security have become a major challenge in Sri Lanka.[8] Nearly 3.9 million people, or 17 per cent of Sri Lankans, experience moderately acute food insecurity; almost 10,000 face severely acute food insecurity; and 56 per cent of households have adopted food-based coping strategies, including reducing meal portion sizes (36 per cent) and skipping meals (19 per cent). This can be primarily attributed to the global and local supply chain disruptions due to the COVID-19 pandemic in 2020 and the Russia-Ukraine war in 2022. Food insecurity was intensified by Sri Lanka's sudden, unexpected ban on chemical fertilisers that affected domestic agricultural production during 2021-2022.[9]

Food insecurity was intensified by Sri Lanka's sudden, unexpected ban on chemical fertilisers that affected domestic agricultural production during 2021-2022.

7 Food and Agriculture Organization, "An Introduction to the Basic Concepts of Food Security", Food Security Information for Action Practical Guides, EC – FAO Food Security Programme, 2008 https://www.fao.org/4/al936e/al936e00.pdf.

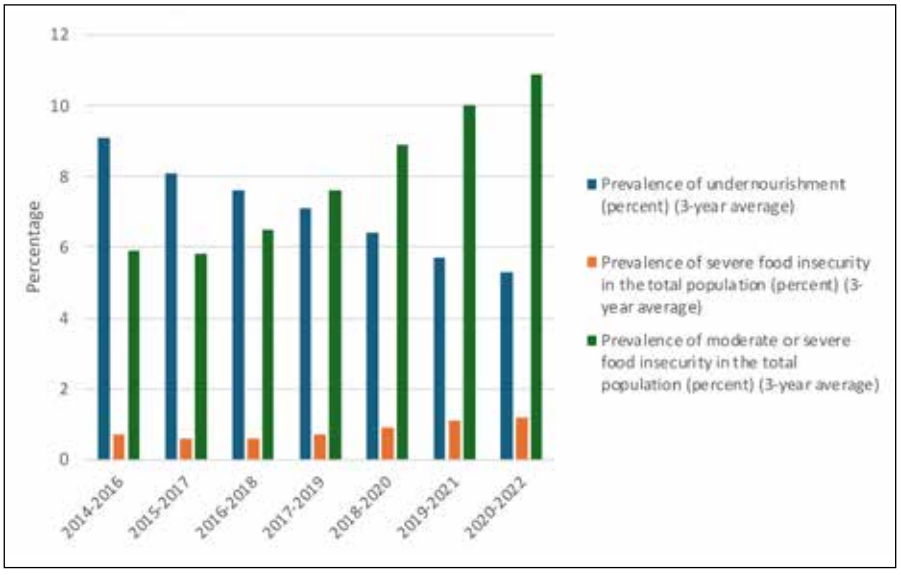
8 Food and Agriculture Organization, "Special Report – FAO/WFP Crop and Food Security Assessment Mission (CFSAM) to the Democratic Socialist Republic of Sri Lanka", CFSAMs Special Reports, 25 May 2023, https://doi.org/10.4060/cc6202en.

9 Manoj Thibbotuwawa, "Building Resilient Agricultural Value Chains during COVID-19", IPS (eds), SOE Report 2021, Institute of Policy Studies, 2021; Sachini Niwarthana, N Dissanayake, Manoj Thibbotuwawa and H S R Rosairo, "The Impact of Chemical Fertilizer Ban on the Paddy Sector: Propensity Score Matching and Value Chain Analysis", Research Paper #21, Feed the Future, Michigan State University, September 2023, https://www.canr.msu.edu/prci/publications/SJAE_Sachini_2023_final_sept_20%20edited%202.pdf; and Manoj Thibbotuwawa, Nimesha Dissanayake and Sachini Niwarthana, "The Ukraine War and its Food Security Implications in Sri Lanka", International Food Policy Research Institute Policy Note 24, 2023. https://ebrary.ifpri.org/utils/getfile/collection/p15738coll2/id/136591/filename/136803.pdf.

Undernourishment remained at 5.3 per cent of the population, on average, during the last three years.

Malnutrition provides a good indicator of whether food security prevails at the household level. Figure 1 shows changes in some of the food security indicators in Sri Lanka in recent years. It shows that the prevalence of moderate or severe food insecurity in the population has become worse during the last three years, rising from 10 per cent in 2019-2021 to 11 per cent in 2020-2022. Also, severe food insecurity has slightly worsened from 1.1 per cent during 2019-2021 to 1.2 per cent from 2020 to 2022. Undernourishment remained at 5.3 per cent of the population, on average, during the last three years.

Figure 1: Fluctuation of Undernourishment and Food Insecurity in Recent Years



Source: Food and Agriculture Organization (2024), FAOSTAT, http://www.fao.org/faostat/en/#data/FS.

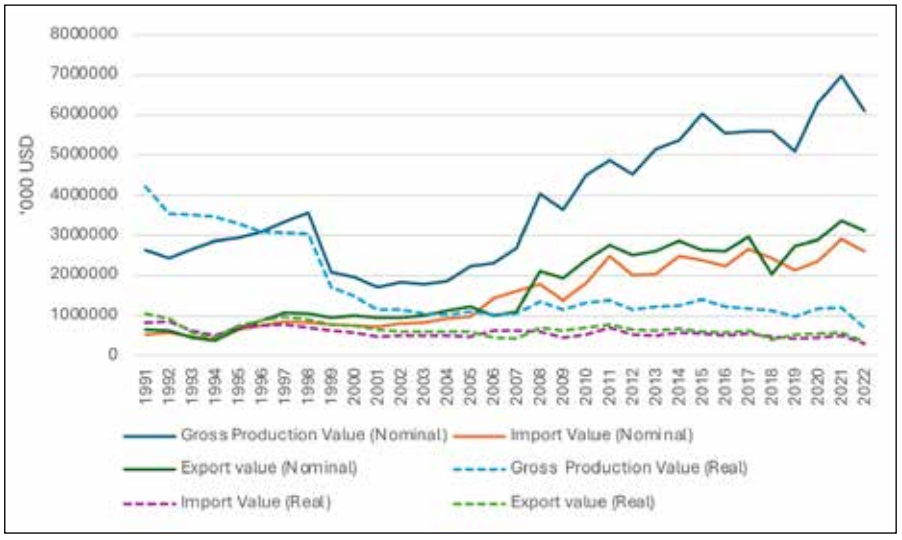
Current Food Availability Situation in Sri Lanka

Food availability in Sri Lanka is dependent on local production and imports of food crops, livestock products, and fish. Despite the share of agriculture in GDP declining over the years, agricultural gross output has more than doubled from US$3 billion (S$4.01 billion) in 1991 to US$7 billion (S$9.37 billion) in 2021 in nominal terms (Figure 2). However, the country spends a significant amount of foreign exchange to import food.

Nominal agricultural imports have increased sixfold from US$0.5 billion (S$0.67 billion) in 1991 to US$3 billion (S$4.01 billion) in 2021. However, the growth in nominal agricultural exports from US$0.7 billion (S$0.94 billion) in 1991 to US$3.4 billion (S$4.55 billion) in 2021 was more than sufficient to balance rising food imports. Real agricultural gross output was in a declining trend until the early 2000s and then stayed constant until 2021. Real import and export values stayed constant throughout until 2021. Notably, there was no noticeable negative impact on either nominal and real agricultural production, imports, or exports during the COVID-19 pandemic. This is understandable since the government allowed the farmers to continue with their usual farming operations without any restrictions even during the national lockdown periods.

Notably, there was no noticeable negative impact on either nominal and real agricultural production, imports, or exports during the COVID-19 pandemic.

Figure 2: Nominal and Real Values of Gross Agriculture Production, Imports and Exports



Source: Food and Agriculture Organization. (2024), FAOSTAT. http://www.fao.org/faostat/en/#data/FS.

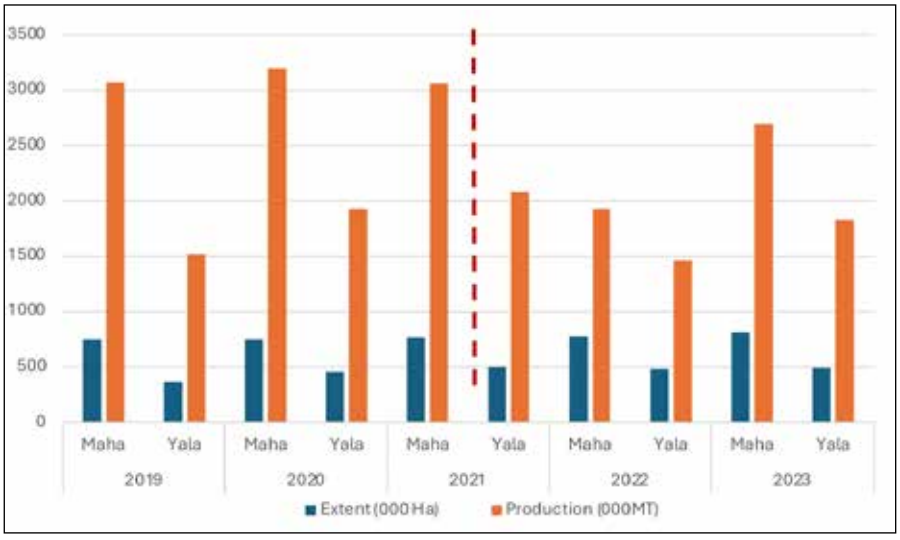
The ban on chemical fertilisers was one of the major supply shocks that affected food production and contributed to food shortages and food inflation. While the ban was lifted in six months, the damage from the flaws in this policy decision had already occurred giving rise to a string of adverse events on food security. The gross production, import and export values declined by 12 per cent, 11 per cent and

eight per cent respectively, in nominal terms and by 41 per cent, 40 per cent and 38 per cent respectively, in real terms (Figure 2).

The reason was a shortage of fertilisers at the beginning of the Maha season due to the import ban.

When the ban was imposed, the Yala cultivation season in 2021 had already started with the available fertiliser, and therefore, there was no observed impact on paddy cultivation relative to the previous Yala season. However, even with the lifting of the ban, and no reductions in the cultivated extent, both paddy production and paddy yield dropped significantly, by 37 per cent and 34 per cent respectively, in the Maha 2022 season relative to the previous Maha season (Figure 3). The reason was a shortage of fertilisers at the beginning of the Maha season due to the import ban. The reductions in paddy production and yield levels reported in the Yala 2022 season were 30 per cent and 26 per cent respectively, compared to the Yala 2021 season.

Figure 3: Seasonal Fluctuation of Paddy Extent and Production (Maha 2019-Maha 2023)



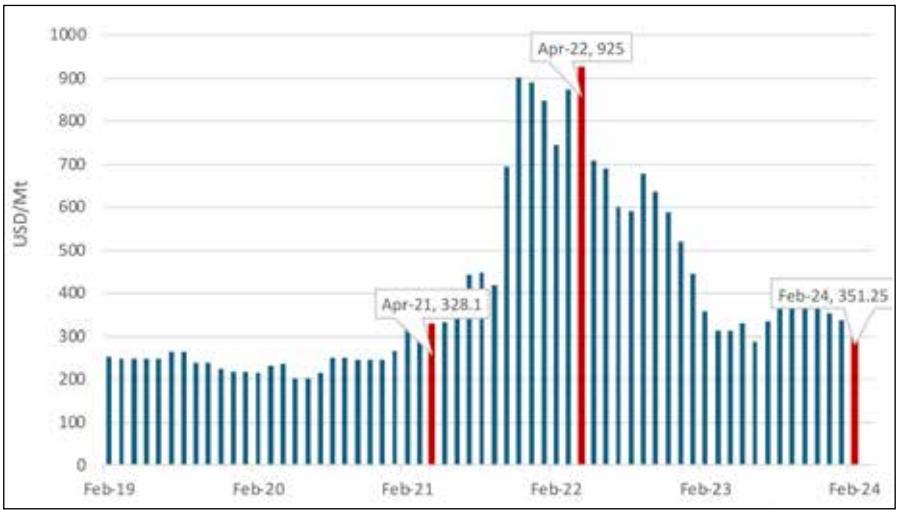
Source: Department of Census and Statistics of Sri Lanka. (2024) Paddy Statistics, http://www.statistics.gov.lk/Agriculture/StaticalInformation/PaddyStatistics#gsc.tab=0

While this declining trend was reversed in the Maha and Yala seasons in 2023, recording a 40 per cent and 25 per cent increase in paddy production compared to the past seasons, the productions were 12

per cent lower than they were before the fertiliser ban in 2021. The reason could be the export restrictions set out by fertiliser-producing countries and the exorbitant fertiliser prices in the world market, which impacted Sri Lanka's fertiliser imports due to dwindling foreign reserves in the country. The price of urea rose by 182 per cent from US$328 (S$440)/metric tonne (MT) in April 2021 to an all-time high of US$925 (S$1,238)/(MT) in November 2021 before declining by 62 per cent to US$351 (S$470)/MT in April 2024 (Figure 4).

The reason could be the export restrictions set out by fertiliser-producing countries and the exorbitant fertiliser prices in the world market, which impacted Sri Lanka's fertiliser imports due to dwindling foreign reserves in the country.

Figure 4: Fluctuations in Urea Fertiliser Price (February 2019-February 2024)

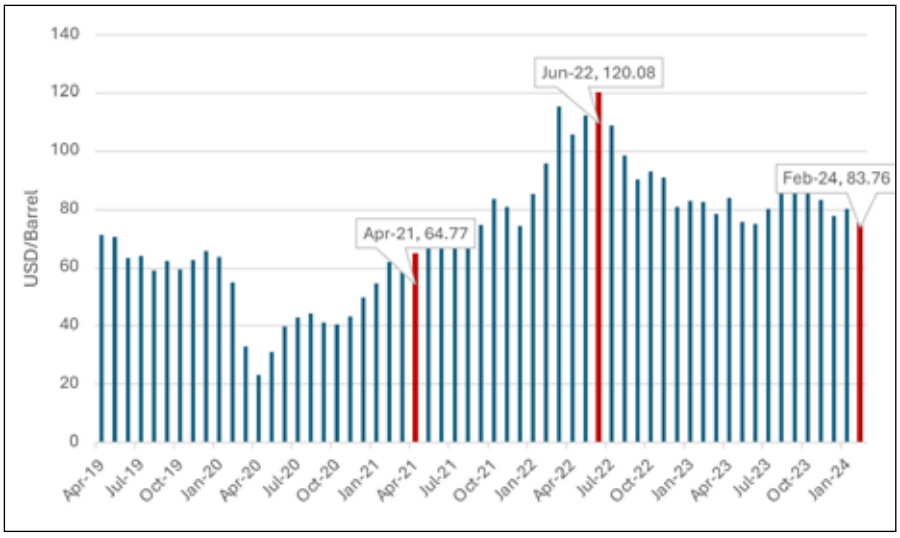


Source: Index Mundi (2024). Commodity Price Data, https://www.indexmundi.com/commodities/?commodity=urea&months=60.

Price hikes made headlines with crude oil prices soaring following Russia's invasion of Ukraine in February 2022.[10] The Brent spot price of a crude oil barrel reached a historic high of US$133 (S$178.10) on 8 March 2022 with a staggering 108 per cent rise from US$64 (S$85.70) in April 2021 (Figure 5). The oil price shock worsened Sri Lanka's food availability since oil is an essential component of the agriculture sector used for irrigation, operation of agricultural implements, and transportation of inputs and final products, among others.

[10] Manoj Thibbotuwawa, et al, "The Ukraine War and its Food Security Implications in Sri Lanka", International Food Policy Research Institute Policy Note 24, 2023. https://ebrary.ifpri.org/utils/getfile/collection/p15738coll2/id/136591/filename/136803.pdf.

Figure 5: Fluctuation of Brent Crude Oil Prices (2019-2023)

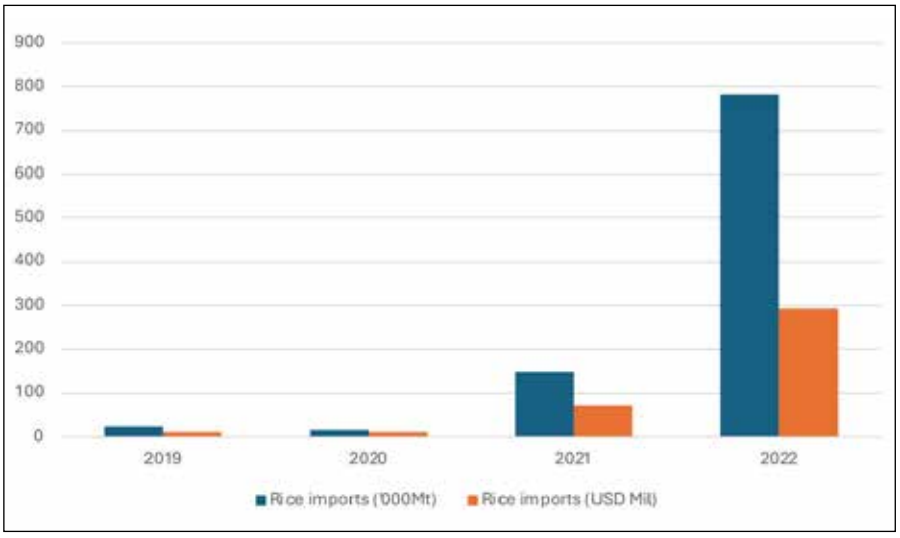


Source: Index Mundi (2024). Commodity Price Data, https://www.indexmundi.com/commodities/?commodity=crude-oil-brent&months=60.

However, Sri Lanka had to import a significant amount of rice and other food from the world market despite the foreign exchange shortages with which the country was plagued.

This has had severe implications for Sri Lanka's food security, requiring the country to import food and seek support from different countries to fill the production gap. Rice is the staple diet of Sri Lankans, and the country is nearly self-sufficient in rice. Sri Lanka's rice imports amount to less than five per cent of the country's total rice supply. Imports of many other crops are also negligible due to domestic production, except dhal, onions, wheat flour and sugar. However, Sri Lanka had to import a significant amount of rice and other food from the world market despite the foreign exchange shortages with which the country was plagued (Figure 6). Rice imports were estimated at 783,000 MT in 2022, which is more than five-fold the amount imported in 2021 (147,000 MT). The import value too increased by four-fold from US$73 million (S$97.8 million) in 2021 to US$293 million (S$392.2 million) in 2022. Sri Lanka's rice imports of nearly US$108 million (S$144.6 million) during the first seven months of 2023 also show the gravity of the problem in 2022.

Figure 6: Rice import value of Sri Lanka from 2019-2023 (US$ Million)



Source: Central Bank of Sri Lanka (Various years). Economic & Social Statistics of Sri Lanka, https://www.cbsl.gov.lk/en/publications/other-publications/statistical-publications/economic-and-social-statistics.

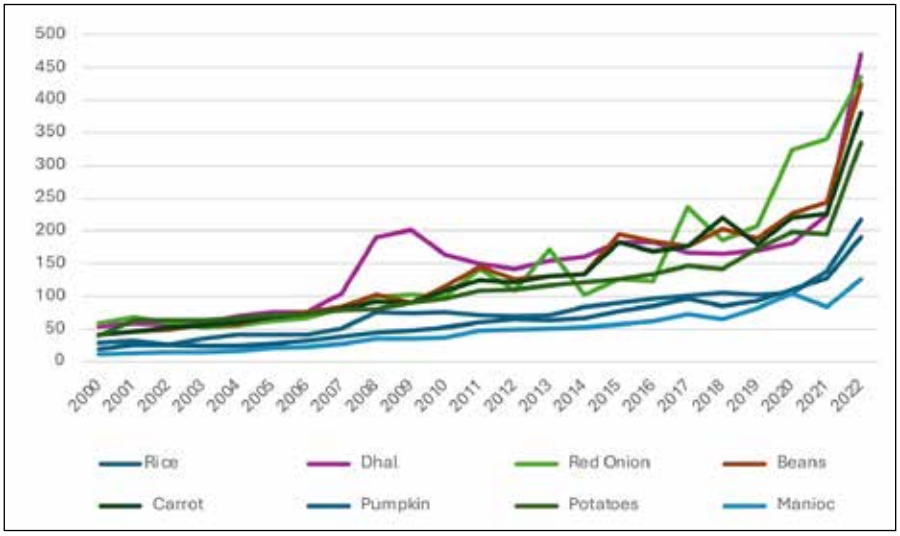
Recent Changes in Household Access to Food

Household access to food mainly depends on a household's capability to either self-produce or purchase food. Here we discuss the purchasing aspect of food access.

Household income and food prices are the two major factors that determine economic access to food by households. Figure 7 shows the changes in the nominal retail price of some selected food commodities over the last two decades. The nominal prices of all food commodities show increasing trends that could be attributed to a shift in demand because of the growing population, rising real disposable incomes and, in certain cases, taxation effects. Continuously increasing nominal food prices until 2020 followed by an exponential increase during the last couple of years have had significant negative impacts on household access to food. This has aggravated food insecurity and malnutrition in a large number of households.

Continuously increasing nominal food prices until 2020 followed by an exponential increase during the last couple of years have had significant negative impacts on household access to food.

Figure 7: Nominal Retail Prices of Selected Food Commodities (Rs/Kg) 2000-2022

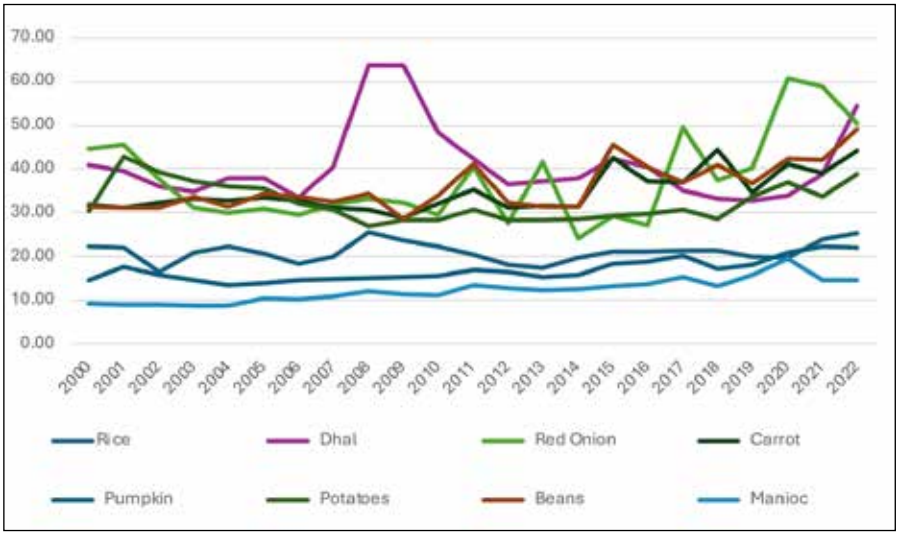


Source: Central Bank of Sri Lanka (Various years). Economic & Social Statistics of Sri Lanka, https://www.cbsl.gov.lk/en/publications/other-publications/statistical-publications/economic-and-social-statistics.

Higher food prices raised the cost of a diet causing poor households to limit their food consumption and shift to less nutritious and unhealthy diets.

In real terms, prices of food commodities showed declining or constant trends until about 2020, as shown in Figure 8. However, since 2021, they have been gradually increasing along with nominal food prices. This is because of the volatility of global oil prices, rising prices of international food and intermediate inputs, and high logistics costs. These, coupled with the compounded impact of steep currency depreciation, have caused food prices to rise faster than other commodities in Sri Lanka. Additionally, the effect of these shocks has been intensified by the unexpected ban on chemical fertilisers because of its effect on domestic agricultural production during 2021-2022. Higher food prices raised the cost of a diet causing poor households to limit their food consumption and shift to less nutritious and unhealthy diets.

Figure 8: Real consumer prices of selected food commodities (Rs/Kg), 2000-2022



Source: Authors' calculation based on Central Bank of Sri Lanka (Various years). Economic & Social Statistics of Sri Lanka, https://www.cbsl.gov.lk/en/publications/other-publications/statistical-publications/economic-and-social-statistics.

Conclusion and Policy Recommendations

The foregoing analysis reveals that food security in Sri Lanka has become worse in the last few years starting with the outbreak of COVID-19 in 2020 and further affected by the ban on chemical fertilisers in 2021. Additionally, the analysis showed that challenges exist in both food production and food prices, as well as across the nutrition aspects. This calls for simultaneous actions by multiple organisations, which is lacking at present. In the short term, introducing a targeted food ration scheme covering essential food for the most vulnerable groups through the recently introduced 'Aswasuma' social protection scheme and strengthening existing nutritional assistance programmes such as school meals, 'Thriposha', and 'Poshana Malla' programmes could be recommended.

This calls for simultaneous actions by multiple organisations, which is lacking at present.

However, in the long term, the development of sustainable agriculture should be viewed as the central element of food security as Sri Lanka has a large food production sector that is the backbone of the country's food availability and access. Importation and proper

Sri Lanka also needs to strengthen its storage capacity and maintain a national strategic food reserve (buffer stock) with a digital monitoring system to stabilise food security.

distribution of fertilisers for essential crops could be considered an immediate requirement on a priority basis. To improve fertiliser use efficiency, Sri Lanka should promote the adoption of good agricultural practices, including site-specific applications and integrated plant nutrition management techniques. Sri Lanka also needs to strengthen its storage capacity and maintain a national strategic food reserve (buffer stock) with a digital monitoring system to stabilise food security.

Since the agriculture sector alone cannot address all the aspects of food security, nutrition, health and education interventions as well must be undertaken concurrently to ensure proper utilisation of food by the people.

Appendix 1
About the Editors and Authors

Dr Fazlullah Akhtar is a Senior Researcher at the Center for Development Research, University of Bonn, Germany. Previously, he worked with various national and international organizations, including the Ministry of Higher Education, Ministry of Rural Rehabilitation and Development, the Food and Agriculture Organization of the United Nations and the Office of the President of the Islamic Republic of Afghanistan. He holds a PhD in Engineering and an MSc in Water Management from the University of Bonn, Germany.

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Professor Dhar was instrumental in establishing the Centre for WTO Studies of the Indian government and was the Head of the Centre for several years. He also served as a Senior Consultant in the Planning Commission.

Professor Dhar was a member of the Indian delegation in multilateral treaty negotiations, including the World Trade Organization, the United Nations (UN) Framework Convention on Climate Change, the World Intellectual Property Organization, and the Convention on Biological Diversity. He has served in expert groups of several inter-governmental organizations.

Professor Dhar has been interacting closely with several inter-governmental organisations. He has been a consultant to the UN Conference on Trade and Development, the UN Economic and Social Commission for Asia and the Pacific, the UN Development Programme, the International Labour Organization, the World Health Organization and the South Centre, among others. He has presented research papers at several international and national conferences and has

publications in reputed national and international journals. He is a regular columnist in several national dailies.

Professor Dhar has served on the Board of Directors of the Export-Import Bank of India and was a Member of the Board of Trade, Government of India. He is an Adviser to the Asia-Pacific Research and Training Network on Trade of the UN Economic and Social Commission for Asia and the Pacific.

Mr Saeeduddin Faridi is a Research Analyst at the Institute of South Asian Studies (ISAS) at the National University of Singapore. His research interest includes infrastructure, green transition and environmental governance. Prior to joining ISAS, Mr Faridi was a research associate at the Council for Strategic and Defence Research in New Delhi where his work focused on non-traditional security in South Asia and the Indo-Pacific region. He has also worked as a researcher at Gateway House, Mumbai, engaging in research on green hydrogen, critical minerals supply chains and economic security. He holds a Master's degree in International Politics from the School of Oriental and African Studies, University of London.

Dr Muhammad Umar Farrukh has a PhD in Economics from University of Agriculture Faisalabad Pakistan. He is working as an Assistant Professor in Department of Economics at Government College Women University Sialkot (GCWUS). He is a health economist/development economist with extensive experience in primary and secondary research; analysis of farmer behaviours under risk and uncertainty; gender, poverty and food security; agribusiness and supply chain analysis; and poverty and social analysis. Prior to joining GCWUS, he was the lecturer/researcher at National University of Modern Languages School of Economics. Dr Farrukh has published and presented his research work in top journals and conferences respectively. He has managed several multi-disciplinary research and development projects.

Dr Yamuna Ghale is a renowned food security expert with extensive experience in policy analysis, research, and advocacy. She holds a PhD in Food Security Governance and Right to Food from Agriculture and Forestry University, Nepal.

She has served as an expert member in various organisations, including the Ministry of Agriculture and Livestock Development and the Ministry of Women, Children and Senior Citizen. Dr Ghale has also been involved in several consultancy projects, including reviewing gender equality strategies and documenting women-responsive agriculture in Nepal.

Dr Ghale is an Expert Member for the Government of Nepal in the National Nutrition and Food Security Coordination Committee and National Land Use Council. Likewise, she serves as a Board of Trustee for the Gandaki University, Nepal. She is affiliated with various organizations, including the Nepal Center for Contemporary Research, Women for Change in Agriculture and Natural Resources and the Food First Information Network. He has published numerous papers and articles on food security, gender and natural resource management.

Dr Sajjad Hyder is associated with the Technology and Innovation Support Center at the Government College Women University, Sialkot.

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She did her postdoctoral research at Columbia University, US, and undertook joint research with Professor Jeffery Sachs. She has a Masters and PhD in Economics from University College London, University of London. She has also participated in the Leadership Decision-Making programme at Harvard University, US.

Dr Khatun sits regularly in various policy-making and advisory bodies at home and abroad. She is a member of the High-level Advisory Board on the Productive Capacities Index of the United Nations (UN) Trade and Development. She is also a member of the BRAC Board, the largest non-governmental organisation in the world, which works for the cause of the left-behind people. Dr Khatun is a member of the Task Force on Climate, Development, and the International Monetary Fund, an initiative of Boston University, US.

Earlier, she worked as a Research Fellow at the Bangladesh Institute of Development Studies, an Environment Specialist for the UN Development Programme, and an Economist for the US Agency for International Development Mission in Bangladesh. She taught economics at universities in Bangladesh and England and was a Visiting Fellow at various international research organisations. In 2023, she was the Co-Chair of the T20 Task Force on 'Accelerating SDGs: Exploring New Pathways to the 2030 Agenda' to the G20.

Dr Khatun's expertise includes macroeconomic policy, climate change, environment, energy economics, aid effectiveness, international trade and World Trade Organisation issues, digital economy, youth employment, health issues, interests of the least developed countries,

Sustainable Development Goals and women's contribution to the economy. She has several publications to her credit at home and abroad.

Dr Khatun regularly speaks on economic issues in the national and international media, including BBC World Service Television, Al-Jazeera Television, and Voice of America Radio. She regularly contributed to BBC Bangla at the BBC World Service during 1991-96 in London. She hosted popular talk shows on national television on economic issues. She is a columnist for the Daily Star, a leading daily in Bangladesh. She is invited regularly to write for the East Asia Forum based in the Crawford School of Public Policy at the Australian National University.

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Prior to joining ADBI, he was a senior global programme manager for the International Maize and Wheat Improvement Centre's (CIMMYT) socioeconomics and sustainable intensification programs and served as chair of the staffs' committee at CIMMYT.

He also previously worked for the Royal Monetary Authority of Bhutan's Research and Statistics Department and served as a research fellow at the WorldFish Centre. He was also Senior Fellow and Japan chair at the Indian Council for Research in International Economic Relations; Chief of research, planning, and monitoring and Visa/Mastercard director at the Bank of Bhutan Ltd; and Assistant Professor of development economics at South Asian University.

He has over 130 publications in Scopus indexed journals and has guest-edited several journal special issues. He also serves as an editorial board member of the Asian Development Review. He lectures at the University of Tokyo and Hitotsubashi University in Japan on current issues in development economics.

Dr Fathimath Shafeeqa is currently working as a Director for the Institute of Research and Development and as a part time lecturer in the Maldives National University and other colleges and has extensive experience in teaching environmental education.

She has taught undergraduate and postgraduate courses, and her focus is mainly on environmental education, curriculum development and education philosophy and sociology.

Dr Shafeeqa also worked as the manager for Live & Learn Environmental Education Maldives, advocating and ensuring that awareness and education lead to a positive environmental attitude among the school children, tourist resort staff and community members.

Her research interests include environmental education pedagogies, climate change and its impact on the Maldivian environment and how people perceive this phenomenon.

Dr Puspa Sharma is a Visiting Senior Research Fellow at the Institute of South Asian Studies at the National University of Singapore. He has about 19 years of experience in policy research on trade and development issues and has provided expert services to the government of Nepal and several international organisations such as the Asian Development Bank, United Nations Economic and Social Commission for Asia and the Pacific and United Nations Office of the High Representative for Least-Developed Countries, Landlocked Developing Countries and Small Island Developing States.

Dr Sharma was an expert member of the teams that prepared the Nepal Trade Integration Strategy 2023 and Nepal's Trade Logistics Development Policy 2022 for the government of Nepal. From 2009 to 2021, he worked at the South Asia Watch on Trade, Economics and Environment (SAWTEE), a think tank based in Kathmandu, in various capacities, latest as its Executive Director. He was also the Editor-in-Chief of SAWTEE's flagship publication Trade Insight. He is a member of the International Advisory Network of the Forum on Trade, Environment & the SDGs, an initiative of The Graduate Institute, Geneva, and a member of the Standing Group on Food Policy and Governance, European Consortium of Political Research.

Dr Sharma has published articles in esteemed peer-reviewed journals such as *Agriculture and Human Values*, *Journal of Comparative Policy Analysis: Research and Practice*, and *Globalizations*. He has also authored, reviewed and edited books, book chapters, working papers, research reports, policy briefs, briefing papers and articles on trade, least developed countries graduation, landlocked developing countries' concerns, agriculture and food systems,

regional integration, paperless trade and other development issues focusing on Nepal and South Asia.

Dr Sharma holds a PhD in Public Policy from the Australian National University, which he earned as an Australia Awards scholar. He earned his MA degree in Global Finance, Trade and Economic Integration from the University of Denver, Colorado, as a Fulbright student. He also holds an MA degree in Economics from the Tribhuvan University, Kathmandu.

Dr Manoj Thibbotuwawa is a Research Fellow at the Institute of Policy Studies of Sri Lanka (IPS) with research interests in agriculture, agribusiness value chains, food security, climate change and environmental and natural resource economics. He has more than 19 years of research experience at IPS.

He has collaborated and served as a consultant to several international organisations such as the World Food Programme, Food and Agriculture Organization of the United Nations, the International Fund for Agricultural Development, the International Food Policy Research Organization, the Australian Centre for International Agriculture Research, the Japan International Cooperation Agency, the United States Agency for International Development, the European Unio and the World Bank.

Dr Thibbotuwawa holds a BSc (Agriculture) with Honours from the University of Peradeniya, an MSc (Agricultural Economics) from the Post-Graduate Institute of Agriculture at the University of Peradeniya, and a PhD from the University of Western Australia. He has also obtained a Post-Graduate Diploma in Modelling and Accounting for Sustainable Development from the International Institute of Social Studies in The Hague.

Dr Thibbotuwawa is a recipient of the prestigious Nuffic Fellowship from the government of the Netherlands and the Endeavour Award from the government of Australia.

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