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FOOD SECURITY IN BANGLADESH: KEY CHALLENGES AND POLICY PROPOSALS

Abstract

This paper aims to look into the food security scenario of Bangladesh through the lens of national and international indices and statistics, analyse and examine the three key challenges towards achieving food security of Bangladesh, and present a set of policy proposals for government and other concerned stakeholders to ensure food security. This paper collects data from open sources and reports published by various national, international, public and private organisations, and researchers. The rationale of this study is to re-examine the current state of food security and to provide policy options for government and other concern in this regard. Bangladesh has significantly improved in agricultural production that has strengthened the availability of food. This paper shows how the key challenges: poverty, climate change, and COVID-19 together have made a disturbance in ensuring access, utilisation and, stability- the crucial perimeters of food security. These key challenges are linked with other factors and have made food security issue more complex and critical. Based on the discission, this paper also presents a set of policy proposals for the concerns to ensure food security by overcoming the key challenges.

Keywords: Food Security, Agricultural Production, Poverty, Climate Change, COVID-19

1. Introduction

States have the primary responsibility for their own economic and social development, including the progressive realisation of the right to adequate food in the context of national food security.[1] Nobel Laureate Amartya Sen brings an argument in his book *Poverty and Famine* that the problem of food security and famine is not about the failure of food supply but food access. To solve this problem of food security and famines caused by the inaccessibility to food, he promotes the entitlement approach. He writes, "the entitlement approach to starvation and famines concentrates on the ability of people to command food through the legal means available in the society,

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[1] Food and Agriculture Organization (FAO), *The Right to Food Guidelines*, *Information Papers and Case Studies* (Rome: Communication Division, FAO, 2006).

including the use of production possibilities, trade opportunities, entitlement *vis-à-vis* the state, and the other method of acquiring food."[2] Six structural aspects are widely recognised that may make an individual suffer from entitlement failure – law labour productivity, adverse terms of trade, limited access, poor asset possession, restricted borrowing capacity, and the absence of safety net provision of transfers.[3]

Food security has a deep relation with human security. As a component of human security, the concept of food security has been taken as a conceptual framework of this paper. According to Article 15(a) of the constitution of the Government of the People's Republic of Bangladesh, the state is primarily responsible for ensuring basic necessities-food, clothes, shelter, education and health- to all citizens. Moreover, according to Article 18(1), improving nutrition level and public health is also considered as one of the primary duties of the state. Apart from the constitutional duties, Bangladesh has promised to ensure food security as per the Universal Declaration of Human Rights (UDHR). Twelve years later, in 2000, through a task force report titled "A Policy Plan of Overall Food Security for Bangladesh," the concern was further addressed. As part of SDG Goals, the Government of Bangladesh has made commitments to "end hunger, achieve food security and improved nutrition, and promote sustainable agriculture"[4] (Goal-2) by 2030.

One of the major challenges that Bangladesh faces today is ensuring food security for all. Though there are significant achievements in food grain production and food availability, food insecurity at national, household or individual level can trigger a threat for the country and its government. Bangladesh has achieved a significant progress in increasing domestic production of food grains. It helped with overcoming the constraints of national food availability. But adequate food was not sufficient for ensuring national food security. Ensuring food security for all requires a major effort at enhancing access to food and subsequent utilisation of food by the poor and distressed households.[5]

According to the existing literatures in the field of food security of Bangladesh, the challenges of ensuring food security are: over-population, scarcity of land, price hike of food items in the domestic and global market, disruptions in the food supply chain, high wage rate of agricultural labour and labour shortage, unsafe food and low food quality, unsafe drinking water, poverty, high under-employment, and inequality

[2] Amartya Sen, *Poverty and Famines*, *an Essay on Entitlement and Deprivation* (New York: Oxford University Press, 1981): 45.

[3] Mahfuz Kabir, "Conceptualization and Measurement of Food Security: The Context of Bangladesh," *BIISS Journal* 26, no. 1 (2005): 65.

[4] United Nations, "Sustainable Development Goals," accessed December 10, 2021, https://sdgs.un.org/goals/goal2

[5] Narayan Chandra Nath, "Food Security of Bangladesh: Status, Challenges and Strategic Policy Options," accessed January 14, 2022, https://bea-bd.org/site/images/pdf/080.pdf

of income in the society, etc. However, this paper argues that poverty, climate change, and COVID-19 are also among the notable causes. This paper addresses the following key questions: what are the emerging key challenges to ensuring food security in Bangladesh? and how these key challenges have made the path of ensuring food security more complex and critical? This paper also provides a set of policy proposals in response to the question, "how" to overcome the challenges to ensure food security.

2. Food Security: A Conceptual Understanding

Today's world and its population have to meet with different types of threats. Protracted crises, violent conflicts, natural disasters, persistent poverty, epidemics and economic downturns impose hardships and undercut prospects for peace, stability and sustainable development.[6] These crises are complex, resulting in multiple forms of human insecurity. The human security approach is a proven analytical and planning framework that supports more comprehensive and preventive responses by the United Nations (UN), cutting across sectors, developing contextually relevant solutions, and adopting partnerships to build a world free from fear, want and indignity.[7] In 2012, the UN General Assembly (UNGA) adopted Resolution 66/290, which acknowledges the concept of human security that brings together the three pillars of the United Nations: development, human rights, and peace and security. The approach can assist member states in identifying and addressing widespread, cross-cutting challenges to the survival, livelihood and dignity of people.[8]

The relationship between human security and food security is based on the idea of full realisation of the rights to adequate food as a fundamental human right, and one that leaves no one behind.[9] The right to adequate food is only established when all people have the physical and economic access to adequate food or its means of procurement at all times. Article 25(1) of the UDHR states, "everyone has the right to a standard of living adequate for the health and well-being of himself and of his family, including food, clothing, housing and medical care and necessary social services, and the right to security in the event of unemployment, sickness, disability, widowhood, old age or other lack of livelihood in circumstances beyond his control."[10] Thus, food security has been an integral part of human security.

In general, food security indicates to the access to food and ensuring people's

[6] United Nations, "What is Human Security," accessed February 04, 2022. https://www.un.org/humansecurity/what-is-human-security/,
[7] United Nations, "What is Human Security."
[8] FAO and United Nations Trust Fund for Human Security (UNTFHS), "Human Security and Food Security," 2016, accessed March 06, 2022, https://www.fao.org/3/i5522e/i5522e.pdf
[9] FAO and UNTFHS, "Human Security and Food Security."
[10] United Nations General Assembly, "Universal Declaration of Human Rights," accessed March 10, 2022, https://www.un.org/en/about-us/universal-declaration-of-human-rights

right to consume. A family can be considered as "secured" only when its members are not hungry and have no worries about possible starving in near future. Over the time, the idea of food security has evolved a lot. For instance, in the 1960s, top priority was to ensure food for nationals through domestic production or import. Ensuring supply in the market and keeping the price within the purchasing power of the common people were identified as priorities. In the World Food Summit (WFS) held in 1974, food security was defined as: "availability at all times of adequate world food supplies of basic foodstuffs to sustain a steady expansion of food consumption and to offset fluctuations in production and prices."[11] In 1983, Food and Agriculture Organization (FAO) elaborated the concept of food security as: "ensuring that all people at all times have both physical and economic access to the basic food that they need."[12]

Over the time, as part of human security, food security has drawn a pivotal attention. Thus, the concept of food security has evolved gradually that includes more other points to consider. With the evolving changes with defining the issue, the 1996 WFS successfully generated the most accepted definition of food security that states, "Food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food that makes their dietary needs and food preferences for an active and healthy life."[13] From this definition, four main dimensions of food security can be identified. These dimensions are presented in Table 1.

Table 1: Four Main Dimensions of Food Security, FAO (2008)[14]

Availability	It addresses the "supply side" of food security and is determined by the level of food production, stock levels and net trade.
Accessibility	An adequate supply of food at the national or international level does not guarantee household level food security. Concerns about insufficient food access have resulted in a greater policy focus on incomes, expenditure, markets and prices in achieving food security objectives.
Utilisation	Utilisation is commonly understood as the way the body makes the most of various nutrients in the food. Combined with good biological utilisation of food consumed, this determines the nutritional status of individuals.
Stability	Even if our food intake is adequate today, we are still considered to be food insecure if we have inadequate access to food on a periodic basis, risking a deterioration of our nutritional status. Adverse weather conditions, political instability, or economic factors (unemployment, rising food prices) may have an impact on our food security status.

At the 33rd Session of the Committee on World Food Security, 2007, FAO issued a statement to reaffirm its vision of a food-secure world saying, "FAO's vision of a world without hunger is one in which most people are able, by themselves, to obtain the food they need for an active and healthy life, and where social safety nets

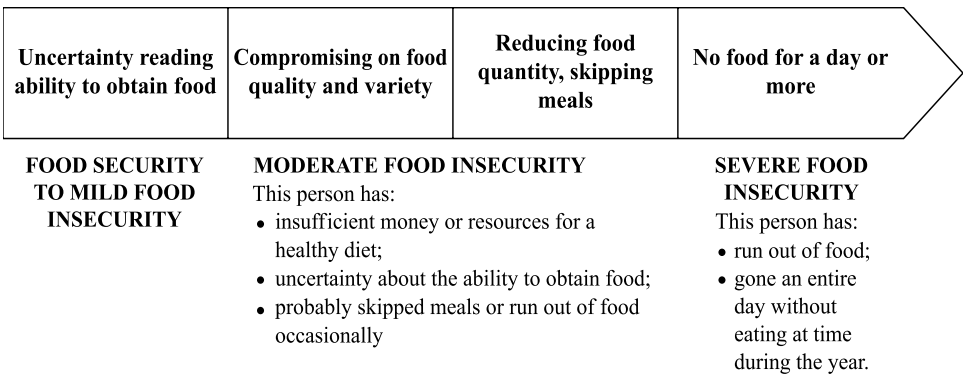
[11] FAO, *Trade Reforms and Food Security*.
[12] FAO, *Trade Reforms and Food Security*.
[13] World Food Summit, *FAO Policy Brief*, Issue 2 (June 2006)
[14] FAO, "An Introduction to the Basic Concepts of Food Security," accessed December 13, 2021, https://www.fao.org/documents/card/en/c/2357d07c-b359-55d8-930a-13060cedd3e3/

ensure that those who lack resources still get enough to eat."[15]

The four dimensions must be fulfilled simultaneously to realise the objectives of food security. However, in the context of Bangladesh, access to food is dependent upon the domestic production, stock maintaining by both government and private entities, and international export-import. In micro level, it is dependent upon production or purchasing power of families, capacity of preservation, and access to food in the local market. Apart from these, other factors including ensuring food safety and nutrition, ensuring food for poor populations, and aid in needs also play vital role. FAO's explainer provides an easier idea of food insecurity which is relevant in this context. According to FAO, "A person is food insecure when s/he lack regular access to enough safe and nutritious food for normal growth and development and an active and healthy life. This may be due to unavailability of food and/or lack of resources to obtain food."[16]

Food security can be measured through different levels of severity using the Food Insecurity Experience Scale (FIES) by FAO shown below:

Figure 1: Food Insecurity Experience Scale (FIES), FAO[17]



As per FIES, there are three stages of food insecurity: food security to mild food insecurity; moderate food insecurity; and severe food insecurity. Uncertainty regarding ability to obtain food refers to the stage of "food security to mild food insecurity"; compromising food quality and variety, reducing food quantity and skipping meals refer to the stage of "moderate food insecurity"; and no food for a day or more refers to the stage of "severe food insecurity" (see Figure 1). In the stage of moderate food insecurity, the person has insufficient money or resources for a healthy diet, and uncertainty about the ability to obtain food. Severe food insecurity refers to

[15] FAO, *Climate Change and Food Security: A Framework Document* (Rome: FAO, 2008), 3.
[16] FAO, "Hunger and Food Security," accessed May 05, 2022. http://www.fao.org/hunger/en/
[17] FAO, "Hunger and Food Security."

the situation that a person is out of food, and, led the entire day without having food at times during the year.

3. Food Security: Bangladesh Context

According to Population and Housing Census 2022, since the independence, the population has increased two times from 70 million to 165.16 million at present.[18] Though a significant progress has been made in grain production in Bangladesh over the past decades, rapid population growth, and consequently, high and growing food requirements pose a difficult challenge given the limited availability of cultivable land in Bangladesh.[19]

In overall count, Bangladesh ranked 80th position (score 54.0) of 113 countries in Global Food Security Index (GFSI) 2022. More specifically, in four categories, Bangladesh ranked 87th (score 52.1), 46th (score 61.5), 71st (score 58.4) and 93rd (score 43.9) in affordability, availability, quality and safety, as well as sustainability and adaptation respectively.[20]

Another internationally accepted index is the Global Hunger Index (GHI). The GHI has established a severity scale to measure hunger around the globe. The range, 0-9.9 is Low Hunger; 10.0-19.9 is Moderate Hunger; 20.0-34.9 is Serious Hunger; 35.0-49.9 is Alarming Hunger, and 50 or more is Extremely Alarming Hunger. In GHI index 2021, Bangladesh stood 76th out of 116 countries with a score of 19.1.[21] Bangladesh's score pattern in GHI since 2000 suggests that Bangladesh is gradually alleviating Serious Hunger and is moving towards Moderate Hunger, a positive pattern indeed. Both Pakistan and India are behind Bangladesh with scores of 24.7 and 27.5.[22]

In Asia and the Pacific: Regional Overview of Food Insecurity and Nutrition, Statistics and Trends 2021 published by FAO, prevalence of food insecurity of Bangladesh has been well depicted that in 2018-2020 period, number of food insecure people has rose to 52.0 million (31.9 per cent) from 50.8 million (31.5 per cent) in 2017-2019. During the period, 1.2 million people have added to the list of food insecure people in Bangladesh, as shown in Table 2.

[18] Bangladesh Bureau of Statistics, *Population & Housing Census 2022*, vii.
[19] FAO, "Nutrition," accessed May 13, 2022, https://www.fao.org/ag/agn/nutrition/bgd_en.stm
[20] Global Food Security Index, Country Profile: Bangladesh, accessed October 17, 2022, https://impact.economist.com/sustainability/project/food-security-index/explore-countries/bangladesh,
[21] Welt Hunger Hilfe and Concern Worldwide, *Global Hunger Index 2021* (Bonn/Dublin: October 2021), accessed April 12, 2022, https://www.globalhungerindex.org/pdf/en/2021.pdf,
[22] Welt Hunger Hilfe and Concern Worldwide, *Global Hunger Index 2021*.

Table 2: Prevalence of Food Insecurity in Bangladesh[23]

Country	Year	Moderate Food Insecurity		Severe Food Insecurity	
		in Million	in per cent	in Million	in per cent
Bangladesh	2014-2016	50.4	32.2	20.7	13.3
	2016-2018	50.2	31.5	18.5	11.6
	2017-2019	50.8	31.5	17.2	10.6
	2018-2020	52.0	31.9	17.1	10.5

Though Bangladesh has achieved a significant improvement in agricultural production, it still has to depend on importing major food grains especially rice and wheat to ensure the availability. Total volume of food grains (public & private) import for the Fiscal Year (FY) 2021-22 was 5.00 million metric ton, of which rice was 0.99 million metric ton and wheat was 4.01 million metric ton. Food grains import trend of Bangladesh has been shown in Table 3.

Table 3: Food Grains (Rice and Wheat) Import of Bangladesh[24] (in Million Metric Ton)

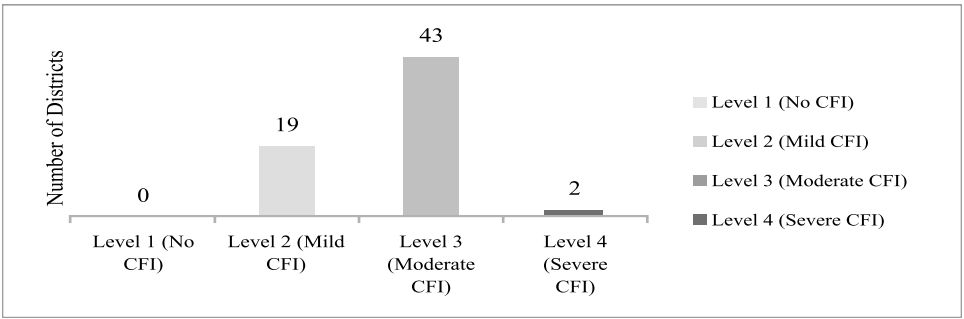
Food Grains	2018-19	2019-20	2020-21	2021-22
Rice	0.21	0.004	1.36	0.99
Wheat	5.63	6.43	5.34	4.01
Total	5.84	6.434	6.70	5.00

According to Bangladesh IPC Chronic Food Insecurity Report (June 2022), out of all 64 districts, 19 districts namely Chandpur, Brahmanbaria, Narsingdi, Chattogram, Tangail, Cumilla, Feni, Gazipur, Dhaka, Madaripur, Munshiganj, Manikganj, Rajbari, Narayanganj, Kushtia, Bogura, Magura, Sylhet and Rajshahi have been classified in Integrated Food Security Phase Classification (IPC) Level 2 and 43 districts have been classified in IPC Level 3. These districts are: Barishal, Barguna, Bhola, Patuakhali, Jhalokati, Pirojpur, Cox's Bazar, Bandarban, Khagrachhari, Noakhali, Lakshmipur, Rangamati, Gopalganj, Faridpur, Kishoreganj, Jamalpur, Mymensingh, Shariatpur, Netrakona, Sherpur, Chuadanga, Bagerhat, Jashore, Jhenaidah, Khulna, Narail, Meherpur, Joypurhat, Satkhira, Natore, Naogaon, Nawabganj, Sirajganj, Pabna, Gaibandha, Dinajpur, Nilphamari, Lalmonirhat, Rangpur, Panchagarh, Thakurgaon, Maulvibazar and Habiganj. Remaining two districts- Kurigram and Sunamganj have been classified in IPC Level 4, as shown in Figure 2.

[23] FAO and United Nations Children's Fund (UNICEF), *Asia and the Pacific: Regional Overview of Food Security and Nutrition*, *Statistics and Trend* (Bangkok: FAO, 2021), 35-37, accessed December 18, 2021, https://www.fao.org/publications/card/en/c/CB7494EN

[24] Government of the People's Republic of Bangladesh, Ministry of Food, Bangladesh Food Planning and Monitoring Unit (FPMU), *Bangladesh Food Situation Report*, April-June 2022 (Dhaka: Ministry of Food, 2022).

Figure 2: Number of Districts in Different Chronic Food Insecurity (CFI) Levels[25]



Though Bangladesh has increased its production significantly, high rate of malnutrition is still posing credible threat to Bangladesh's food security. Children's nutritional status reflects their both physical and mental health. When children have access to an adequate food supply, are not exposed to repeated illness, and are well cared of, they reach their growth potential and considered well nourished.[26] According to Multiple Indicator Cluster Survey 2019, out of 22,450 children with weight and age surveyed, 22.6 per cent is moderately and severely underweight and 5.2 per cent is severely underweight; out of 22,055 children with height and age surveyed, 28.0 per cent is moderately and severely stunted whereas 8.8 per cent is severely stunted; and, out of 22,011 children with weight and height surveyed, 9.8 per cent is moderately and severely wasted, 2.3 per cent is severely wasted, 2.4 per cent is moderately and severely overweight, and 0.8 per cent is severely overweight, as shown in Table 4.

Table 4: Nutritional Status of Children[27]

Weight for age		No. of children with weight and age	**Height for Age**		No. of children with height and age	**Weight for Height**				**No. of Children with Weight and Height**
Underweight			Stunted			Wasted		Overweight		
Per cent below			Per cent below			Per cent below		Per cent below		
Moderate and severe	Severe		Moderate and severe	Severe		Moderate and severe	Severe	Moderate and severe	Severe	
22.6	5.2	22,450	28.0	8.8	22,055	9.8	2.3	2.4	0.8	22,011

It happens because "nutrition is closely inter-linked to poverty in Bangladesh, which is widespread and affects the bottom and middle wealth quintiles."[28] Apart from this, "as food availability and accessibility to food increase, hunger may decrease, but not necessarily malnutrition. One reason for persistent malnutrition may lie in the

[25] Integrated Food Security Phase Classification (IPC), *Bangladesh IPC Chronic Food Insecurity Report* (June 2022), 6.
[26] BSS and UNICEF Bangladesh, *Multiple Indicator Cluster Survey 2019* (Dhaka: BSS, 2020), 216.
[27] BSS and UNICEF Bangladesh, *Multiple Indicator Cluster Survey 2019.*
[28] Save the Children, *Malnutrition in Bangladesh: Harnessing Social Protection for the Most Vulnerable* (London: Save the Children, 2015), 6.

complex interaction between food intakes and illness, affecting the food utilisation by the body, which in turn, is influenced by the overall health and care-giving environment."[29]

4. Food Security in Bangladesh: Role of Agriculture

Agriculture is the most integral part of ensuring food security. Agriculture sector of Bangladesh plays a pivotal role in food production, generating employment and boosting export. Moreover, it has reduced rural poverty and has accelerated national growth. Agricultural sector has made significant contribution in grain production, fisheries and livestock production. Impacts on all forms of agricultural production will affect livelihoods and access to food. Producer groups that are less able to deal with climate change, such as the rural poor in developing countries, risk having their safety and welfare compromised.[30]

4.1 *Grain Production*

Bangladesh is one of the top rice producers in the world. As per the United States Department of Agriculture (USDA) data, with a production of 36 million metric ton of rice, Bangladesh remains in the 3rd position globally in rice production after China and India that produce 146 million metric ton and 116 million metric ton respectively.[31]According to the joint report by Bangladesh Bureau of Statistics (BBS), Ministry of Agriculture, and Department of Agricultural Extension (DEA), in FY 2020-2021, Bangladesh produced 44.36 million metric ton grains. Moreover, for FY 2021-2022, the expected production is set at 46.58 million metric ton.

Table 5: Grain Production of Bangladesh[32] (in Million Metric Ton)

Food Grains	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22*
Aus*	2.13	2.71	2.92	3.01	3.29	3.24
Amon*	13.66	13.99	14.06	15.5	14.44	14.96
Boro*	18.02	19.58	20.39	20.18	19.89	20.98
Total Rice	33.81	36.28	37.37	38.69	37.62	39.18
Wheat	1.31	1.1	1.15	1.25	1.09	1.09
Maize	3.58	3.89	4.7	5.4	5.66	5.63
Total	38.70	41.27	43.22	45.34	44.37	45.9

* Note: Aus, Amon and Boro are local variety of rice

[29] Akhter U Ahmed, Nurul Islam and Mustafa K Mujeri, eds., *Securing Food for All in Bangladesh* (Dhaka: University Press Limited, 2021), 6.
[30] FAO, *Climate Change and Food Security*, 11.
[31] Pinaki Roy and Sohel Parvez, "Ample Food Stock, Bumper Boro Harvest: 'No worries' for next six months," *The Daily Star*, May 16, 2020, accessed August 26, 2021, https://www.thedailystar.net/frontpage/news/no-worries-next-six-months-1903075
[32] Finance Division, *Bangladesh Economic Review 2022* (Dhaka: Ministry of Finance, 2022), 93.

4.2 *Fish Production*

According to the State of World Fisheries and Aquaculture Report 2022, Bangladesh retained its 3rd position in fish production in inland water.[33] But due to the ongoing COVID-19 pandemic, Bangladesh is facing challenges in transporting, supplying, and marketing.

Table 6: Fish Production of Bangladesh[34] (in Million Metric Ton)

Fish Production	2016-17	2017-18	2018-19	2019-20	2020-21
	4.13	4.28	4.38	4.5	4.62

4.3 *Livestock*

At constant prices, the contribution of livestock sector to GDP in FY 2021-22 is 1.90 per cent and the contribution of livestock to the overall agricultural sector is 16.52 per cent.[35] It has an important role to ensure food security and especially in providing necessary protein for the nation. In FY 2020-2021, the number of livestock is 56.33 million, and there are 365.85 million chicken and ducks in Bangladesh.

Table 7: Livestock/Poultry of Bangladesh[36] (in Million)

Livestock/ Poultry	2016-17	2017-18	2018-19	2019-20	2020-21
Total Livestock (Cattle/Buffalo/ Goat/Sheep)	64.75	55.14	55.53	55.93	56.33
Total Poultry (Chicken & Duck)	329.2	338.00	347.04	356.32	365.85

The statistical observations also suggest that animal protein including milk, meat and egg is increasing in the market gradually. In FY 2019-2020, Bangladesh produced 10.68 million ton milk, 7.67 million ton meat and 173.60 million pieces of eggs. In FY 2020-2021, the number increased steadily as Bangladesh produced 11.99 million ton milk, 8.44 million ton meat and 205.76 million eggs. Moreover, in FY 2021-2022 (up to February 2022) Bangladesh has already produced 9.46 million ton milk, 7.10 million ton meat and 157.87 million pieces of eggs.[37]

[33] FAO, *The State of World Fisheries and Aquaculture* (Rome: FAO, 2022), 22.
[34] Ministry of Finance, *Bangladesh Economic Review 2022*.
[35] Ministry of Finance, *Bangladesh Economic Review 2022.*
[36] Ministry of Finance, *Bangladesh Economic Review 2022*, 104.
[37] Ministry of Finance, *Bangladesh Economic Review 2022*, 104.

Thus, Bangladesh's agriculture sector has been showing sustainable growth over the last decade. Agricultural production has been increased significantly in keeping pace with its population growth. This sector is highly potential for Bangladesh to achieve food security. Still, there are lots of challenges for the sustainability of food security of Bangladesh. The following section describes some of the key challenges to ensure food security of Bangladesh.

5. Key Challenges for Bangladesh to Ensure Food Security

In general, the challenges of ensuring food security are over population, land degradation and diminishing productivity of land, scarcity and continuous shrinking of land and water resources, change in the pattern of land use, price volatility of food items in the domestic and global market, poor agricultural diversification, agricultural diseases, disruptions in the food supply chain, labour shortage and high wage rate of agricultural labour, lack of skilled manpower, unsafe food and low food quality, unsafe drinking water, high under-employment resulting in low accessibility to food, high economic poverty, and inequality of income in the society, etc. But, most remarkably, three key challenges–poverty, climate change, and COVID-19 are among the key challenges mentioned above.

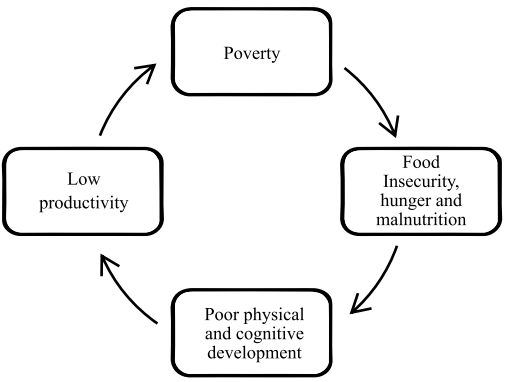
5.1 *Poverty*

Poverty is one of the root causes of food insecurity. The poor do not have adequate purchasing power to secure their access to food, even when food is available in local markets.[38] Hunger, malnutrition and poverty, these three concepts are closely interlinked and very much related to food insecurity. The UN defines poverty as, "a denial of choices and opportunities, a violation of human dignity. It means lack of basic capacity to participate effectively in society. It means not having enough to feed and clothe a family, not having a school or clinic to go to, not having the land on which to grow one's food or a job to earn one's living, not having access to credit."[39] Hunger indicates an uncomfortable or painful sensation caused by insufficient food and energy consumption. All hungry people are food insecure, but not all food insecure people are hungry, as there are other causes of food insecurity, including those due to poor intake of micro-nutrients. Malnutrition originates from deficiencies, excesses or imbalances in the consumption of all forms of nutrients.

[38] Ahmed, Islam and Mujeri, eds., *Securing Food for All in Bangladesh* (Dhaka: University Press Limited, 2021), 5.
[39] Paper Presented by Gordon David on "Indicators of Poverty & Hunger, Expert Group Meeting on Youth Development Indicators," organised by UN Headquarters, New York on 12th – 14th December 2005, 4.

It may be an outcome of food insecurity, or it may relate to non-food factors, such as, inadequate care practices for children, insufficient health services, and an unhygienic environment. As Figure 3 shows the cyclic relations of food security.

Figure 3: Interrelated Phenomena among Food Insecurity, Malnutrition and Poverty[40]



Poverty generates food insecurity, hunger and malnutrition. These factors again are directed towards poor physical and cognitive development and low productivity. According to Household Income and Expenditure Survey (HIES) 2016, within half an era, the incident of income poverty reduced almost 7.2 per cent points from 31.5 per cent in 2010 to 24.3 per cent in 2016. During this period, the compound poverty reduced per year 4.23 per cent. On the other hand, the rate of income poverty reduced from 40.0 per cent in 2005 to 31.5 per cent in 2010. At that time compound poverty annually declined by 4.67 per cent. In rural areas poverty reduction rate is higher (4.68 per cent) than urban areas (1.97 per cent).

Table 8: Poverty in Bangladesh[41]

Head Count Index	2016	2010	Annual Change (in per cent) (2010 to 2016)	2005	Annual Change (in per cent) (2005 to 2010)
National	24.3	31.5	-4.23	40.0	-4.67
Urban	18.9	21.3	-1.97	28.4	-5.59
Rural	26.4	35.2	-4.68	43.8	-4.28

According to the latest estimate, poverty rate stood at 20.5 per cent in 2019.[42]

[40] FAO, *An Introduction to the Basic Concepts of Food Security* (Rome: EC- FAO Food Security Program, 2008), 3

[41] Ministry of Finance, *Bangladesh Economic Review 2022*, 205-206.

[42] Ministry of Finance, *Bangladesh Economic Review*, 205-206.

In poverty alleviation, Bangladesh's performance is better than many developing countries, yet one-fifth of population is living under poverty. Food security may not be ensured by keeping large portion of population under the poverty line. Therefore, poverty remains a major concern on the way to achieving food security in Bangladesh. The ongoing pandemic has also added extra hurdles to the problem. Poor people are being deprived of necessary nutrition and health care. Even if they consume foods, their daily consumption does not meet their nutritional requirement. Malnutrition hinders their physical and mental development. The general idea is that, those who suffer from malnutrition from the beginning of their life, they can hardly get over with the problem in later life. As a result, the impact of poverty becomes "inter-generational."

5.2 *Climate Change*

Climate change affects food production and availability, access, quality, utilisation, and stability of food systems. In short, it impacts all aspects of the food system.[43] Due to Bangladesh's unique geographical position between the Himalayas in the north and the Bay of Bengal in the south, Bangladesh faces a lot of natural calamities. However, the agriculture is also dependent on weather and climate. As a result of such dependency, climate change increases vulnerabilities in agriculture too. Changes including disproportionate rain, flood, land erosion, waterlogging, heat wave, prolonged drought, tornado, cyclone, increasing salinity in coastal area, cold wave, smog problem, and flash flood are wreaking havoc on both agriculture and everyday life. These problems are also creating new challenges in food security and safety. The traditional food system of Bangladesh heavily relies on climate-induced incidents like rainfall, weather, and temperature, water level, soil condition, etc. Moreover, because of geographical location, any climate change incident will adversely influence the food security of Bangladesh.[44]

In the last fifty years, 53 floods took place; among them, six were considered as "Great Flood." Again, in the last 153 years, 20 strong earthquakes took place. Moreover, between 1960 and 1997, at least 167 storms and tornados wreaked havoc among which 15 were severe. These storms damaged resources worth between BDT 25 to 30 billion, and mostly were agricultural goods. Apart from that, further delving shows that, Cyclone Sidr in 2007 damaged 186,883 hectare of farm land totally and 898.645 hectare partially; in money, the damage was worth US$3 billion. On the other hand, 2004's flood also damaged crops worth US$435.89 million; where in 1988, flood damaged 2.5 million ton grains. Again, due to prolonged heat wave and lack of rain, Bangladesh faced threats of drought 20 times in the last fifty years. Moreover, the

[43] Concern Worldwide US, "How Climate Change Increases Hunger — and Why We're All at Risk," accessed December 28, 2021, https://www.concernusa.org/story/climate-change-food-security/

[44] Mohammad M Islam, *The Politics of Food Security in Bangladesh* (Sydney: School of Social Sciences, University of New South Wales, 2012), 126.

heat wave and no rain also damaged grain production by 20-60 per cent. According to Agricultural Information Service (AIS), between 1973 and 1987, droughts damaged 2.18 million ton of rice.[45] In terms of area, 66 per cent, 67 per cent and 38 per cent area of the country were affected in the flood of 1988, 1998 and 2004 respectively.[46] On the other hand, among the cyclones, cyclone of 1970, 1991, 2007 (Sidr) and 2009 (Aila) were remarkable claiming the significant damage of lives, livelihood and agriculture.

According to the DAE, in August 2021, 68,241 hectares of crop land are affected by flood and heavy monsoon in 14 most affected districts: Gaibandha, Kurigram, Lalmonorhat, Sunamgonj, Sylhet, Chapainawabgonj, Natore, Rajshahi, Pabna, Netrokonba, Tangail, Sirajgonj, Faridpur, and Chandpur.[47] The north eastern region of Bangladesh, including Sylhet, Sunamganj, Moulovibaza, Habiganj, Kishoreganj, Netrokona, Brahmanbaria, Mymensingh and Sherpur districts, has experienced flash flood during May-June, 2022 that affected 7.2 million people.[48] This flash flood swept away homes and inundated farmlands.

The BBS Survey shows that out of a total damage and loss of BDT 1,791,988 million, flood, river/coastal erosion, and cyclones together accounted for 85.66 per cent of total damage and losses. Flooding alone was responsible for 56.41 per cent (BDT 1,010,882 million), while river/coastal erosion and cyclones were responsible for 14.99 per cent (BDT 268,703 million) and 14.25 per cent (BDT 255,382 million) respectively. On the other hand, crops witnessed 22.89 per cent and houses witnessed 7.38 per cent of total damage.[49] Thus the natural calamities caused by climate change affected agriculture that ultimately threatened food security of Bangladesh time to time. The damage of agriculture due to natural calamities during 2015-20 is mentioned in Table 9.

Climate change is severely hampering our agriculture and food security. According to agricultural scientists, from seeding stage to reaping stage of crop production, there is a strong need of optimum temperature, humidity, rain, and sunlight. But due to climate change, these factors have changed drastically, yet we still could not adapt our agriculture with the changes. As a result, it is affecting our agriculture and

[45] Md Hamidur Rahman, "Jolobayu Poribortoner Sathe Khaddyo o Krishi Bodlabe," (Food and Agriculture Will Transform Following Climate Change), *Krishikotha*, Special Edition, Karthik 1423 (2016).
[46] ADRC Visiting Researcher Programme, Country Report: Bangladesh, accessed October 10, 2022, https://www.adrc.asia/countryreport/BGD/2021/Bangladesh_CR_FY2021.pdf
[47] Food Security Cluster, *Bangladesh Flood Situation Report* (Rome: FSC, 2021).
[48] UNICEF, Northeastern Flood, Humanitarian Situation Report, no. 4 (Dhaka: UNICEF Country Office, 2022).
[49] Bangladesh Bureau of Statistics (BBS), *Report on Bangladesh Disaster-related Statistics 2021: Climate Change and Natural Disaster Perspectives* (Dhaka: BBS, 2022), 57.

Table 9: Loss and Damage Distribution by Sector and Disaster Type During 2015-20[50] (in Million BDT)

Type of disaster	Total	Crops	Livestock	Poultry	Fishery
Drought	27344	12311	1077	609	262
Flood	1010882	241842	42956	13495	40927
Water Logging	93860	26632	2492	1729	6281
Cyclone	255382	153921	13367	5196	11542
Tornado	15226	4418	336	626	165
Strom/Tidal Surge	15475	2731	783	693	2117
Thunderstorm/Lightning	29195	8821	2184	704	232
River/Coastal Erosion	268703	26765	6597	3044	2498
Landslide	6082	381	173	8	1
Salinity	20756	5934	677	522	2216
Hailstorm	48945	34155	731	348	214
Others	136	51	1	2	5
Total	1791988	517961	71373	26976	66460

production. According to Bangladesh Rice Research Institute (BRRI), climate change is also responsible for increasing disease and pest attack in rice fields. Moreover, due to global warming, increasing rainfall would be resulting in increasing flood in Bangladesh by 40 per cent more than that of now.[51]

Climate change consequences on environment of Bangladesh have been divided into three phases. First phase includes shortages of fresh water availability, increase of natural extreme events, and intrusion of saline water. Second phase includes loss of biodiversity and risk to human health and lives. Third phase includes food contraction, food insecurity, migration and conflicts.

[50] BBS, *Report on Bangladesh Disaster-related Statistics 2021.*
[51] Jahangir Alom, "Poribortito Jolobayute Krishi o Khaddyo," *Krishikotha*, Special Edition (Karthik 1423/2016).

Table 10: The Consequences of Climate Change in Bangladesh[52]

Climate Change Consequences in Bangladesh			
Cause	**Consequence Phase I**	**Consequence Phase II**	**Consequence Phase III**
Climate Change	Shortage of fresh water availability	Loss of Biodiversity	Food contraction
	Increased natural extreme events	Risk to human health and lives	Food insecurity
	Intrusion of Saline Water	-	Migration and conflicts

Consequences of climate change specifically on food security can be understood from Table 11.

Table 11: Consequences of Climate Change on Food Security[53]

Food Security Dimension	Consequences of Climate Change
Availability	• Decreases agricultural yield in some areas locally (especially at tropical areas) that affects dietary diversity • Changes in land suitability for crop production • Increases in temperature that leads to longer growing seasons in temperate regions and reduced frost damage. • CO_2 fertilisation could increase yields for those crops with the physiology to benefit from CO_2 enrichment
Access	• Reduction of yields could result in higher food prices • Loss of income resulting from potential increase in damage to agricultural production
Stability	• Instability of food supplies, and incomes from agriculture because of an increase in extreme events
Utilisation	• Ability to utilise food might decrease because changes in climate increase disease • Threat to food safety due to changes in pests and water pollution

Climate change is resulting in food shortage and is posing real threat to food security. Thus, climate change has become an extra burden on the effort to secure food for all citizens of Bangladesh. However, growing population rate and decrease in farmland are also worsening the situation. All these factors are coupling with each other and are creating a complex equation unfavourable for Bangladesh. In order to address these issues and lift up agro production, multidimensional and coordinated efforts must be taken in advance.

[52] Shaheen Afroze, Sufia Khanom and Akand Muhammad Faisal Uddin, "Climate Change and National Security of Bangladesh," in ed. Golam Mohammad, *National Security Bangladesh 2009* (Dhaka: University Press Limited, 2010), 158.

[53] Met Office Hadley Centre and WFP, *Climate Impacts on Food Security and Nutrition: A Review of Existing Knowledge* (Exeter: Met Office Hadley Centre and WFP, 2012).

5.3 *COVID-19*

The COVID-19 pandemic has affected the whole world and has become a global phenomenon. It has challenged global food security. Already, it has changed the global scenario. For the last five years, the scenario of global hunger was approximately same. But under pandemic, the number increased by 118 million only in one year of 2020. At present, there are 768 million people living under hunger line in the world.[54] Apart from this, the pandemic also resulted increasing of unemployment. According to Bangladesh Bank quarterly report (January-March, 2021), due to pandemic, "the employment declined by 4.3 per cent, and the associated income loss decreased by 8.6 per cent in 2020. While all the three major economic sectors underwent declines in 2020 in terms of working hours, industry and services sectors, employment and labour income (except labour income for agriculture sector) were hit hard by the pandemic. Working hours for industry and services sector faced decreases of 11.5 per cent and 21.6 per cent respectively in 2020. Labour incomes declined by 7.1 per cent and 17.6 per cent for industry and services sectors in 2020, respectively." [55]

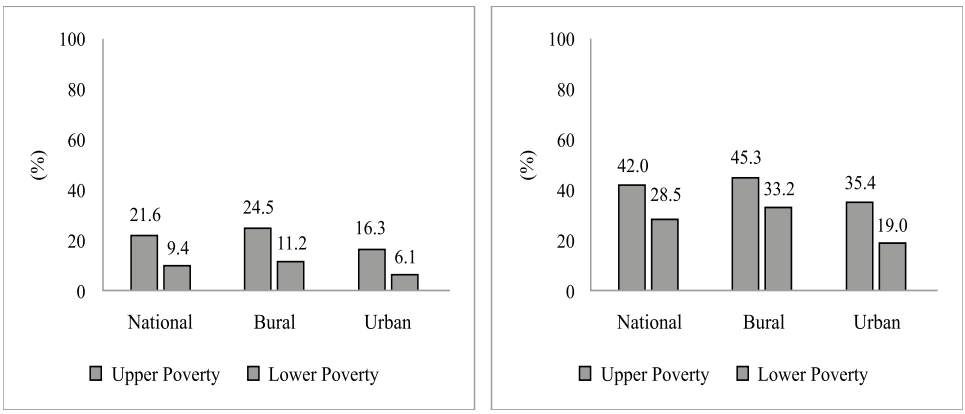
However, pandemic is also responsible for increasing poverty rate. According to various private researches conducted by Power and Participation Research Centre (PPRC), BRAC Institute of Governance and Development (BIGD) and Centre for Policy Dialogue (CPD), during pandemic, the poverty rate is 35-43 per cent at present; which was 20.5 per cent in 2019. Such observation refers that, currently, 60 million people are living under the poverty line. On the other hand, latest research by PPRC and BIGD shows that, because of government's lifting up lockdowns and normalising almost all sectors, the rate of "new" poor has decreased from 22.9 per cent to 21.7 per cent with a sharp reduction of 1.2 per cent. The same research also shows that, the income of poor population under pandemic is 42 per cent lower than their pre-pandemic income.[56]

Household Survey 2020 shows that both the upper and the lower poverty rate is higher for the rural area compared to their urban counterparts, which sustains the pattern in 2018. However, the upper poverty rate has almost doubled while the lower poverty rate tripled in 2020 compared to 2018. At the national level, the upper poverty rate has risen to 42 per cent from 21.6 per cent, and the lower poverty rate has increased to 28.5 per cent from 9.4 per cent during this period. In the case of lower poverty, the rate tripled in both rural and urban areas compared to the respective rates

[54] FAO, *The State of Food Security and Nutrition in the World* (Rome: FAO, 2021), 8.
[55] Md. Salim Al Mamun, "Labour Market Dynamics in Bangladesh: Impact of the COVID-19," *Bangladesh Bank Quarterly* XVIII, no. 3 (January-March 2021), 40.
[56] Abdul Latif Mondol, "Shodesh Vabna: Deshe Khaddyo Nirapottar Jhuki Barche," (Country Thoughts: Food Security Under Threat), *The Daily Jugantor*, August 26, 2020.

in 2018.[57] (see Figure 4).

Figure 4: Poverty by Area in 2018 (A) and 2020 (B)[58]

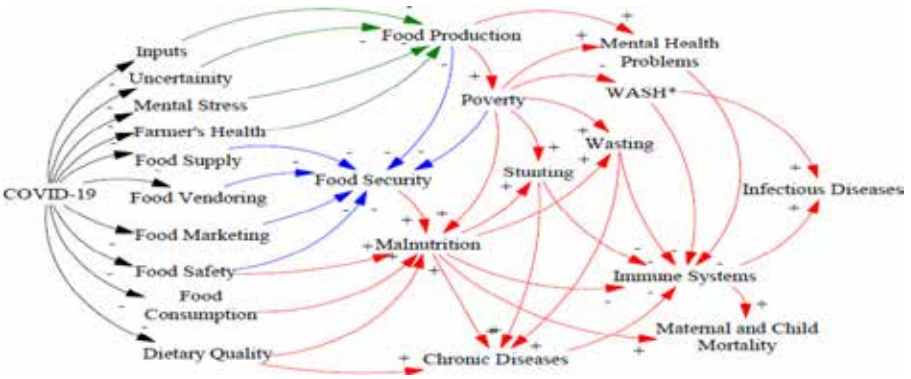


In the aftermath of COVID-19, retail prices of food have become higher in the one hand, and income has become lower in the other hand. As a result, many have curtailed their purchase of fresh food and vegetables. Thus, more and more households had to cut down on the quantity and quality of their food consumption. Reduced calorie intake and compromised nutrition threaten gains in poverty reduction and health, and could have lasting impacts on the cognitive development of young children.[59]

The effects of the COVID-19 pandemic on agro-food systems in Bangladesh likewise bring a set of health-related impacts, as illustrated in the figure below (see Figure 5). Because COVID-19 creates food insecurity through food supply chain disruption, loss of income and purchasing power, and increases in many food prices, there are profound health implications as the vulnerable groups face diminishing access to diversified healthy food diets i.e., vegetables, fish, milk, meat and fruits etc.[60]

[57] South Asian Network on Economic Modelling (SANEM), *COVID-19 Fallout on Poverty and Livelihoods in Bangladesh: Results from SANEM's Nation-Wide Household Survey (November-December 2020)* (Dhaka: SANEM Publications, 2020), 11.
[58] SANEM, *COVID-19 Fallout on Poverty and Livelihoods in Bangladesh.*
[59] Abdullah Shibli, "Food Insecurity Increases amidst the Latest COVID-19 Spike," *The Daily Star*, March 04, 2021.
[60] Byomkesh Talukdar and James Orbinkski, "COVID-19's Implications on Agri-Food Systems and Human Health in Bangladesh," *Current Research in Environmental Sustainability* 3, no. 100033 (2021), https://www.sciencedirect.com/science/article/pii/S2666049021000098#f0010

Figure 5: COVID-19's Impacts on Agri-Food Systems and Related Health Issues.[61]



Note: Black arrows indicate impacts on agri-food systems from COVID-19, green arrows indicate decrease of food production due to impacts of COVID-19, blue arrows indicate impacts on food security due to COVID-19 and red arrows indicate health impacts of COVID-19 from impacts on agri-food systems. "+" indicates an increasing impact and "-" indicates a decreasing impact. WASH*= Water and Sanitation for Health.

Thus, COVID-19 exerted a serious threat to the food security of Bangladesh. However, the government of Bangladesh was successful and achieved appreciation from international community on responding COVID-19 induced food security threat.

Under the Open Market Sale (OMS) programme, 74,000 metric ton of rice was distributed at BDT 10 per kg for the low-income people living in urban areas. The government had allotted BDT 2.51 billion to this. For the agricultural sector, a fund of BDT 50 billion was created to provide running capital. From this fund, loans were disbursed at 4 per cent interest rate among the small and medium farmers in agriculture, dairy, poultry, and fisheries sectors. Government also announced various stimulus packages worth BDT 95.62 billion in different sectors including agriculture, small and medium Enterprises, and export oriented labour intensive sectors.[62] Apart from this, the government adopted a "Family Card" system for 10 million families in an effort to provide essential goods at subsidised prices to low-income people especially to support the rising number of new poor that emerged amid the COVID-19 crisis.[63] Thus, the improvement of food distribution through above mentioned different programmes & stimulus packages in COVID-19, was instrumental in registering positive performance at two fronts: accessibility and utilisation.

[61] Talukdar and Orbinkski, "COVID-19's Implications on Agri-Food Systems."
[62] "Darkness will fade away," *The Daily Star*, https://www.thedailystar.net/frontpage/news/darkness-will-fade-away-1892758
[63] Miraj Shams, "'Family Card' system from March 10," *The Business Post*, March 04, 2022, https://business-postbd.com/front/family-card-system-from-march-10-2022-03-04,

6. Existing Government Policies and Strategies

Keeping the challenges of food security in mind, the government of Bangladesh (GoB) has devised numerous plans, policies, and strategies in order to combat food insecurity. Existing policies and strategies taken by the government are briefly discussed below:

6.1 *The National Food and Nutrition Security Policy (NFNSP): Plan of Action 2021-2030*

The main precursors of NFNSP are the National Food Policy 2006 (NFP) and the National Nutrition Policy (NNP) 2015. Since the NFP 2006, the policy context has changed considerably, with the development agenda shifting from the Millennium Development Goals (MDG) to the Sustainable Development Goals (SDG). For the first time, the GoB has formulated an integrated food and nutrition security (FNS) policy. The Plan of Action covers the 10-year period of the 8th Five Year Plan (July 2020 – June 2025) and the 9th Five Year Plan (July 2025 – June 2030). The five objectives mentioned in the NFNSP:

(1) Ensuring availability of safe and nutritious food for healthy diets.

(2) Improving access to safe and nutritious food at an affordable price.

(3) Increasing the consumption and utilisation of healthy and diversified diets for achieving nutrition improvements.

(4) Enhancing access to nutrition-sensitive social protection and safety nets across life cycle with a focus on vulnerable groups and regions.

(5) Strengthening cross-sectoral FNS governance, coordination, capacity building and partnership for effective policy implementation.[64]

6.2 *Bangladesh Climate Change Strategy and Action Plan (BCCSAP), 2009*

BCCSAP is a 10-year programme that intends to build capacity and readiness of the system to confront the consequences of climate change and threats to food security. Bangladesh is one of the most climate-vulnerable countries as well as susceptible to natural calamities. Therefore, the GoB formulated BCCSAP-2009 which comprises six main strategic areas of which first two areas are directly related to food security. The areas are (a) Food security, social protection and health, and (b) Comprehensive disaster management.[65]

[64] Bangladesh Food Planning and Monitoring Unit (FPMU), *National Food and Nutrition Security Policy Plan of Action (2021-2030)* (Dhaka: Ministry of Food, 2021).

[65] Government of Bangladesh, Ministry of Environment and Forest, *Bangladesh Climate Change Strategy and Action Plan 2009* (Dhaka: Ministry of Environment and Forest, 2009).

6.3 *Bangladesh Delta Plan (BDP) 2100*

The core aim of the BDP2100 is to secure long-term water and food security, economic growth and environmental sustainability. This mega plan integrates all delta related sector plans and policies. The agricultural transformation is aligned with the delta plan because of the great importance of water to agriculture as 70 per cent of total fresh water used in agriculture. Due to its role in food security, agriculture is the most important sector of Bangladesh economy in terms of employment and livelihood as more than 70 per cent of the people in Bangladesh are directly or indirectly involved in this sector. The agriculture of Bangladesh is dominated by crops which accounts about half of total agricultural GDP.[66]

6.4 *National Plan for Disaster Management (NPDM) 2021-2025*

NPDM 2021-2025 exemplified the strategic plan of the GoB in its vision and mission of the Ministry of Disaster Management and Relief (MoDMR) between 2021 and 2025 towards building a resilient nation.[67] Agriculture is the most vulnerable sector in the face of climate change given its heavy dependence on water, weather and climate. One of the major aims of this plan is to reduce the damage to food production generated from natural calamities.

6.5 *National Agriculture Policy (NAP) 2018 and Agriculture Extension Policy (AEP)*

The main source of employment and income of the rural people of Bangladesh is agriculture. Around 41 per cent of the country's total labour force is directly involved in agricultural occupation.[68] NAP (2018) emphasises on ensuring food security and elevate socio-economic status of people by increased productivity and crops diversification, swelling farmers' income, improving marketing system and ensuring safe food production. AEP emphasises on ensuring food security through increased production of all types of crops. Rational use of surface water and solar power irrigation is also focused on the policy.

6.6 *Perspective Plan (PP) 2041*

PP2041 intends to eliminate extreme poverty and reach high income country status by 2041 with a zero-poverty rate. This plan mainly concentrates on two visions: (a) Bangladesh will be a developed country by 2041, with per capita income of over US$12,500 in today's prices, and fully in tune with the digital world; (b) Poverty will

[66] Government of Bangladesh, Ministry of Planning, Bangladesh Planning Commission, General Economics Division, *Bangladesh Delta Plan 2100*, *Baseline Studies: Volume 4*, *Agriculture*, *Food Security and Nutrition* (Dhaka: Bangladesh Planning Commission, Ministry of Planning, 2018).
[67] Ministry of Disaster Management and Relief, *National Plan for Disaster Management (2021-2025)* (Dhaka: Ministry of Disaster Management and Relief, GoB, 2020).
[68] Ministry of Agriculture, *National Agriculture Policy: 2018* (Dhaka: Ministry of Agriculture, GoB, 2018).

become a thing of the past in Sonar Bangla.[69] This plan seeks to achieve zero-poverty rate by ensuring food and nutrition security with sufficient food and nutrition required for a healthy life.

6.7 *The 8th Five Year Plan*

PP2041 would be implemented in four phases where the first phase starts with the 8th FYP. Regarding the population health and nutrition side, it stressed on further reduction of growth of population intending to increase life expectancy and improve child nutrition. The increase in life expectancy to 72 years in 2018, ahead of the target of 70 years set for FY2021, suggests that basic health care and nutrition standards required for survival have exceeded the expectations of the policymakers.[70]

The significant strength of these food and nutrition policies is that the government recognised nutrition as a human right. The policies are comprehensive as well as crucial documents formulated by involving the concerned resource persons of the country. All the policies regarding food security are well coordinated and comprehensive. These policies are adorned with clear goals and objectives with transparent strategies outlining how to achieve the objectives. However, few of the policies lack guidelines for implementation, monitoring and evaluation. The NFNSP lacks strong commitment and allocation of funds. Allocation of funds is a must for policy implementation. There is lack of sufficient directions to transform it into programmes and activities.

7. Policy Proposals

Ensuring food security is a global challenge. On September 23 at the UN Food System Summit 2021, the Prime Minister of Bangladesh, Sheikh Hasina, has provided five-point suggestions to establish a stable global food system. According to her pre-recorded speech, the points are: improving agricultural research, investment and sharing advanced technologies; creating fund for developing countries; increasing global co-operation; increasing co-operation among the countries to reduce food waste; and sharing climate adaptive technologies and distributing funds.[71] In order to maximise food security, Bangladesh has already incorporated food security in its 8th FYP, and has already adopted its Agricultural Policy 2018, Food and Nutrition Security Policy 2020, and its action plan for 2021-30. Though Bangladesh has achieved a lot of success in food production, the key factors like poverty, climate change, and

[69] Government of Bangladesh, Ministry of Planning, Bangladesh Planning Commission, General Economics Division, *Making Vision 2041*, *A Reality: Perspective Plan of Bangladesh 2021-2041* (Dhaka: Bangladesh Planning Commission, Ministry of Planning, 2020).
[70] General Economics Division (GED), *8th Five Year Plan July 2020 - June 2025: Promoting Prosperity and Fostering Inclusiveness* (Dhaka: Bangladesh Planning Commission, Ministry of Planning, 2020).
[71] "PM Hasina Seeks Resilient Global System, Places Suggestions," *Dhaka Tribune*, September 23, 2021.

COVID-19 have exerted an adverse impact on its journey towards food security. To overcome such challenges, following recommendations may be considered:

Firstly, reduction of poverty and inequality is to be emphasised more as this is the root cause of many other obstacles on the way to achieving food security for all of its citizens. In spite of having overall good availability, the high rate of hunger and food insecurity in Bangladesh originates from poor access and utilisation of food. Food security is a dimension of poverty and poverty has a strong correlation to higher levels of malnutrition. Income inequality is also a strong predicator of severe food insecurity in Bangladesh. That is why, social protection for vulnerable and marginal groups, living in disadvantaged and remote areas, should be strengthened. Government should implement nutrition-sensitive protection programmes targeting nutritionally vulnerable people. NGOs may also take more other programmes in this regard. In order to keep the price within purchasing power of the people, problemmes and limitations of agricultural market should be identified. On the other hand, in order to ensure protein for low-income groups, protein sources should be diversified. Apart from meat and fish, other sources such as mushroom, various types of nuts and beans should be promoted. Awareness about nutritious child food, safe water and sanitation should be spread in root level.

Secondly, to combat adverse effects of climate change on food security, a comprehensive policy needs to be taken by the government. Under this policy, awareness programmes in the vulnerable areas are to be introduced; further research on climate change is to be carried out; dedicated "climate fund" has to be introduced; "national food storage system" has to be set up to tackle the food shortage situation in any crisis time in the future; capacity of the relevant ministries, departments, and institutions have to be increased; a high level committee taking the experts and professionals on board has to be formed to take the effective decision about the climate change related issues.

Thirdly, Initiatives should be taken to improve climate adaptive technologies for productivity gains and agricultural diversification. Weather forecast and climate intelligence should also be incorporated with production plan and pesticide management as there is a link between weather and climate with disease and pest attack in farm. In this respect, remote sensing technology may help a lot. Further research projects should be initiated in this regard. New innovations and their use may also contribute to create sustainable agriculture.

Fourthly, agriculture should be given foremost priority in building sustainable food system in post COVID-19 recovery era. Government should also prepare to build a farmer-consumer oriented food system to lead a comprehensive recovery

and increase preparedness for dealing with food insecurity. In order to continue achievement in food production, government must focus on climate adaptive and high productive agriculture and related research. To resolve production problems such as flood, drought, and salinity-induced stress conditions, Bangladesh needs to develop new technologies and innovations through research. To promote agriculture driven employment, it is needed to expand vocational training for rural youth and women and, create employment opportunities.

Fifthly, to keep pace with the growing population rate, a comprehensive initiative has to be taken to increase food production. To achieve this, optimum use of land has to be ensured, land use plan has to be developed, pest control technologies have to be adapted, and short and long term adaptive seeds have to be used; farmers should be made aware of optimum system of operation to ensure sustainable yield. Initiatives should also be taken to promote diversification of horticulture, livestock, poultry, fisheries, and dietary products with high nutrient contents.

Sixthly, soil and fertility management are another important aspect in producing sustainable food and balanced nutrition. In order to create an efficient soil management, emerging technologies such as ICT, Geographic Information System (GIS), crop zoning, biotechnology, laser technology, irrigation system, soil test etc., should be promoted and mobilised in the field level. As mechanisation is cost-effective, quality and time effective, Bangladesh should also promote mechanisation of agriculture. From irrigation to energy, mechanisation and use of renewable energy can create a significant impact.

Seventhly, the small commercial farmers are one of the most integral parts of the agricultural production in Bangladesh. Therefore, it is to be ensured that these farmers get justice on prices for the crops they produced. Besides, marginal farmers can hardly get access to formal lending systems. That is why, their access to credit through suitable institutional reforms must be ensured with highest importance.

Finally, awareness campaigns, from both government and private institutions on importance of safe and nutritious food, should take place massively.

Apart from this, to minimise food waste, it is needed to improve skills and practices, and develop loss reducing technologies, especially, post-harvest process, transportation, packaging, storing and marketing.

8. Concluding Remarks

Bangladesh has achieved an overwhelming progress in agriculture especially in rice and fish production. However, the production of certain non-rice crops, such as pulses, vegetables, and fruits is still not satisfactory. Accessibility to food depends on food prices and household income. In the case of the poorer section of people, though food is available in local markets, they do not have adequate purchasing power to ensure their access to food. Increased food prices affect poor people in two ways, firstly, it lowers their real income and, secondly, it also erodes their purchasing power. Increasing availability and accessibility to food may reduce hunger, but not malnutrition. Malnutrition may affect the food utilisation by the body, and overall health and care-giving environment. The general idea is that those who suffer from malnutrition from the beginning of their life, they can hardly get over with the problem in later life. Thus, ensuring food security may not be possible by keeping large scale of population below the poverty line.

Apart from poverty, climate change and COVID-19 have also made food security issue more complex. Climate change that includes disproportionate rain, flood, land erosion, water logging, heat wave, prolonged drought, tornado, cyclone, salinity in the coastal area, cold wave, smog, flash flood has created new challenges in ensuring food security.

Climate change reduces agricultural production, creates instability of food supplies, and reduces fertility of land for crop production. It also exerts impact on food safety due to modification in pests and water pollution. Lastly, COVID-19 has further worsened the situation. Due to lockdown and limited logistic support, the prices of essential goods were increased. Moreover, farmers were also failed to access fertilisers in time because of lockdowns and limited transportations. As a result, the price of rice has increased drastically.

In this respect, the paper recommends more focus on agriculture, adopting new technologies, saving lands for agriculture and facilitate climate adaptation system to enhance food security in Bangladesh. The government policies need to be more aligned with the local realities. A comprehensive policy to ensure availability, accessibility, utilisation and stability of food can ensure the food security of the country.