Science Discovery Agriculture
2026, Vol. 1, No. 4, pp. 172–187
https://doi.org/10.11648/j.sda.20260104.14

Research Article

The Role of Agriculture in Driving Economic Growth in Bangladesh: Trends and Prospects

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Abstract

The study utilizes both descriptive and analytical methods to evaluate the significance of agriculture in relation to GDP contribution, sectoral expansion, land utilization, crop production and livestock development, agricultural financing, and marketing frameworks. The results indicate that while the proportion of agriculture in GDP has steadily decreased due to a shift towards industrial and service sectors, the broader agricultural sector, including crop production, livestock, and fisheries, remains vital for ensuring food security, providing rural employment, and alleviating poverty. Agriculture's share of GDP declined from about 17% in 2010 to 11.16% in 2024, while its growth rate decreased from 3.26% in FY2019 to 2.61% in FY2023, reflecting an ongoing structural transformation of the economy rather than a loss of the sector's economic importance. Production trends, however, are not uniform across commodities. Wheat production increased by 7.7% in FY2023 compared with FY2022, while summer and winter vegetable production increased from 13.5 and 31.3 lakh MT in FY2020 to 17.0 and 36.7 lakh MT in FY2023, respectively. Livestock populations also showed generally increasing trends during FY2019-FY2023. Nonetheless, obstacles such as limited land availability, vulnerable ecosystems, market inefficiencies, climate change, and regional inequalities continue to constrain agricultural performance. Regional assessments further reveal substantial variation in salinity, flooding, soil degradation, inadequate irrigation, limited access to quality seeds, insufficient credit, and weak marketing infrastructure across divisions. At the same time, technological advancement, agricultural diversification, climate-resilient practices, value-chain development, and improved market linkages provide important opportunities for future growth. Government strategies emphasizing sustainable resource management, productivity enhancement, stronger supply chains, and institutional support can therefore play a critical role in addressing these constraints. In summary, the findings indicate that agriculture remains an important component of Bangladesh's economy, and its modernization, strengthening of resilience, and integration with industry and trade will be critical for maintaining inclusive growth and achieving long-term development objectives.

Keywords

Agriculture, Economic Development, GDP Contribution, Food Security, Rural Employment, Bangladesh

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Received: 4 August 2026; **Accepted:** 14 August 2026; **Published:** 9 November 2026

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1. Introduction

The economy of Bangladesh has managed to bounce back from the negative impacts of the corona virus pandemic. Prior to the pandemic, the GDP growth was recorded at 7.88 percent in FY 2018-19, which dropped to 3.45 percent in FY 2019-20. However, GDP growth has recovered, reaching 6.94 percent in FY 2020-21 and 7.10 percent in FY 2021-22. Nonetheless, the economic growth for FY 2022-23 has been affected by the ongoing Russia-Ukraine crisis. As per the provisional estimates by BBS, the GDP growth for FY 2022-23 is anticipated to be 6.03 percent [10].

In Bangladesh, it is unfortunate that it has become standard practice to establish targets related to the macroeconomic framework that do not align with current realities [12]. For example, the government initially aimed for a GDP growth of 7.5 percent despite the prevailing challenges in the macroeconomic landscape. According to the Monetary Policy Statement (MPS) from the Bangladesh Bank, issued in January 2024, this goal was adjusted down to 6.5 percent. Several multilateral organizations expressed a more cautious outlook regarding the GDP growth prospects for Bangladesh. For instance, the Asian Development Bank (ADB) forecasted the GDP growth for FY2024 to be 6.1 percent [1, 4]. Similarly, the projections from the IMF and World Bank for the same period are 5.7 percent and 5.6 percent, respectively [21, 37].

2. Methodology

2.1. Research Design

This study follows a descriptive and analytical research design to evaluate the contribution, transformation, challenges, and future prospects of agriculture in Bangladesh. The analysis is based on secondary quantitative data and focuses on examining temporal trends, sectoral changes, agricultural productivity, resource utilization, financial support, and regional disparities in agricultural development.

2.2. Data Source and Study Period

The study uses secondary data collected from reliable national and international sources, including the Bangladesh Bureau of Statistics (BBS), Bangladesh Bank, Bangladesh Economic Review, World Bank, Department of Livestock Services (DLS), Food Planning and Monitoring Unit (FPMU), Department of Agricultural Marketing (DAM), and Bangladesh Agricultural Research Council (BARC). The study covers mainly the period from FY2015/16 to FY2023/24, depending on data availability. Data obtained from different sources were cross-checked, and discrepancies were resolved by prioritizing the most recent and authoritative sources.

2.3. Variables and Indicators

The study evaluates agriculture's role in economic development using indicators related to economic contribution, agricultural production, resource use, and institutional support. The major indicators include agriculture's share and growth rate in GDP, sectoral contribution to GDP, land use pattern, crop production and yield, livestock population and productivity, agricultural credit disbursement and recovery, and agricultural marketing margins. Regional variations were assessed using division-level indicators, including production characteristics, climate-related constraints, irrigation availability, soil and land conditions, access to agricultural inputs, credit facilities, and marketing infrastructure.

2.4. Analytical Techniques

Trend analysis was applied to examine changes in agricultural and economic indicators over time. Growth rates and percentage changes were calculated to evaluate changes in production, GDP contribution, land utilization, livestock population, agricultural credit, and market margins. Comparative analysis was conducted to identify differences among agricultural sectors and administrative divisions. Regional constraints and opportunities were analyzed through division-wise comparisons based on agricultural performance indicators and reported challenges from secondary sources.

3. Result & Discussion

3.1. Economic Growth

Over the past three decades, Bangladesh's economy has grown on by an average of 4.0% annually [20]. However, macroeconomic targets have often appeared inconsistent with prevailing conditions [12]. The government initially set GDP growth at 7.5% for FY2024 but later revised it to 6.5% in the January 2024 according to Monetary Policy Statement (MPS). Multilateral institutions offered lower forecast such as the ADB projected 6.1%, while the IMF and world Bank estimated growth rate of 5.7% and 5.6%, respectively [21, 37].

3.1.1. GDP Growth

Figure 1 presents Bangladesh's GDP growth rates from fiscal year 2016/17 to the forecast for 2024/25. Between 2016/17 and 2019/20, the economy maintained robust growth, peaking at 7.9% in 2019/20. However, a significant decline occurred in 2020/21, with growth dropping to 3.4%, largely due to the economic impact of the COVID-19 pandemic. The COVID-19 pandemic has significantly influenced the economy by presenting challenges in addressing the economic crisis and controlling the virus simultaneously while trying to sustain economic activity [27]. The economy has experienced a substan-

tial downturn, as seen in the decline of jobs, wages, and personal savings. The following years (2021/22 and 2022/23) saw recovery, with growth rebounding to around 7%. However, in 2023/24, growth slowed to 5.8%, and the forecast for 2024/25 suggests a further decline to 3.3%, possibly due to global economic pressures, inflation, and internal challenges. This indicates the need for strategic policy measures to restore higher growth momentum.

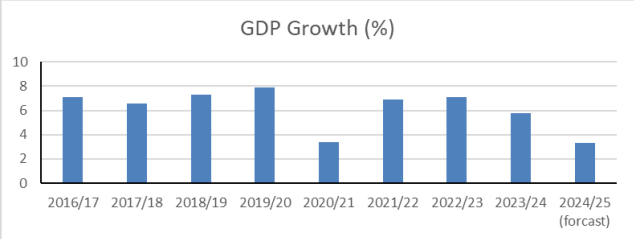


Figure 1. *GDP growth of Bangladesh (in percent) [38].*

3.1.2. Sources of Provisional GDP Growth

In FY2024, services contributed the largest share of incremental GDP (49.2%), followed by industry (41.7%) and agriculture (6.0%). Manufacturing contribution declined from 36.0% in FY2023 to 27.2% in FY2024. Agriculture, industry, and services grew by 3.21%, 6.66% and 5.80%, respectively. While construction recorded 7.45%. Per capita GDP and GNI reached USD 2,675 and USD 2,784, rising by 1.21% and 1.27%, respectively [13].

3.1.3. Investment

Table 1 shows the gross investment-to-GDP ratio of Bangladesh, which declined from 31.31% in FY2020 to 30.98% in FY2024.

Table 1. *Investment-GDP ratio in Bangladesh (in percent) [14].*

Investment type	FY20	FY21	FY22	FY23	FY24 (p)
Total	31.31	31.02	32.05	30.95	30.98
Private	24.02	23.70	24.52	24.18	23.51
Public	7.29	7.32	7.53	6.77	7.47

3.1.4. GDP and Employment

The quarterly GDP estimates and labor force survey data from the BBS offer an opportunity to consistently analyze the link between economic growth and employment. As seen in Figure 2, the employment elasticity of GDP, which reflects the change in employment relative to changes in economic output, shows a downward trend.

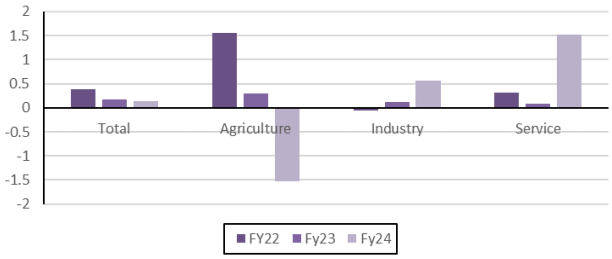


Figure 2. *Employment elasticity of GDP [13].*

3.2. Agricultural Shares in GDP

Agriculture plays a crucial role in maintaining food security, fostering the development of rural economies, and promoting political stability, which is why it is subject to extensive regulation and incentives in numerous countries [29]. In Bangladesh, the agricultural GDP rose to 3618.10 BDT million in 2024, up from 3505.60 BDT million in 2023.

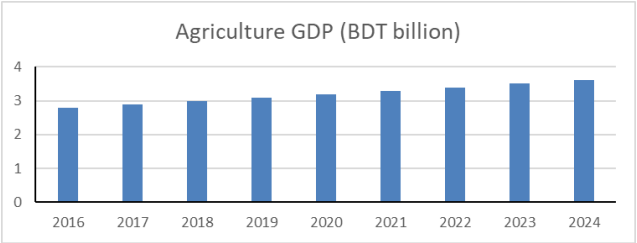


Figure 3. *Bangladesh GDP From Agriculture [10].*

In Figure 4, agriculture's contribution to Bangladesh's GDP has declined consistently over the past decade, indicating a gradual structural shift in the economy. In 2010, agriculture accounted for 17% of GDP, but by 2024, this share had decreased to 11.16%. This trend reflects ongoing diversification of the economy toward industry and services, improvements in productivity, and urbanization. However, agriculture remains a critical sector for employment and rural livelihoods [22].

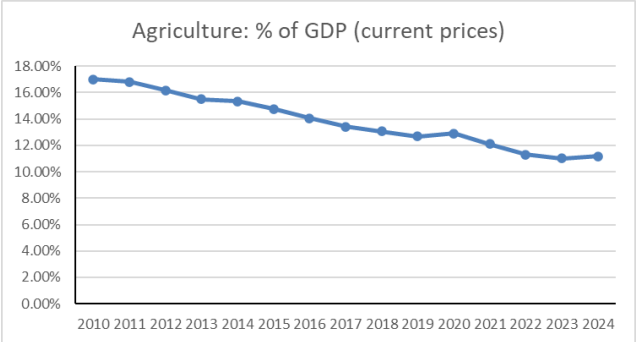


Figure 4. *Trends in the contribution of GDP in Bangladesh agriculture in current prices [7, 34].*

The growth rate and agricultural GDP contribution have been declining each fiscal year since FY19. (Table 2).

Table 2. Growth and Share in GDP by Agriculture [18].

Indicators	FY 19	FY20	FY21	FY22	FY23
Share in GDP (%)	12.56	12.52	12.07	11.61	11.20
Growth Rate (%)	3.26	3.42	3.17	3.05	2.61

Table 3 presents the GDP contributions of agricultural sectors and their major sub-sectors in Bangladesh at current market prices from FY2015/16 to 2022/23.

Table 3. Gross Domestic Product (GDP) at Current Market Prices [9].

Industrial origin sector	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23*
A. Agriculture	279505	301167	329380	353443	380446	410661	445531	486315
1. Agriculture, forestry, and fishing	279505	301167	329380	353443	380446	410661	445531	486315
a) Crops & horticulture	138280	148669	162333	173378	186116	199631	215365	236869
b) Animal Farming	46655	49516	53186	56290	59715	63293	67399	73571
c) Forest and related services	37188	39864	43563	46639	50399	55916	63748	68204
d) Fishing	57382	63118	70298	77136	84216	91822	99020	107672

Table 4 shows the percentage contribution of sectoral growth rate of GDP from FY2015/16 to FY2022/23.

Table 4. Sectoral Growth Rate of GDP at Constant Prices [9].

Industrial origin sector	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23*
A. Agriculture	14.06	13.62	13.14	12.56	12.52	12.07	11.61	11.20
1. Agriculture, forestry, and fishing	14.06	13.62	13.14	12.56	12.52	12.07	11.61	11.20
a) Crops & horticulture	6.96	6.68	6.39	6.04	5.96	5.70	5.46	5.25
b) Animal Farming	2.35	2.26	2.17	2.07	2.06	1.98	1.91	1.85
c) Forest and related services	1.87	1.84	1.81	1.76	1.78	1.75	1.72	1.70
d) Fishing	2.89	2.84	2.77	2.70	2.71	2.64	2.53	2.41

3.3. Land Use in Agricultural Production

Bangladesh possesses approximately 21,891 thousand acres of land available for agricultural use, encompassing both cultivated and uncultivated areas [9]. Table 5 outlines the distribution of this land for various purposes throughout the nation. Rapid urban development has led to a decline in agricultural land across the country; therefore, converting cultivable wasteland and increasing cropping intensity are essential for long-term food security [32].

Table 5. Land use pattern (in '000'acres) [9].

Year	FY2019	FY2020	FY2021
Total	36465	36465	36465
Forest	6363	6363	6363
Not available for cultivation	8364	8284	8312
Culturable waste	639	671	700

Year	FY2019	FY2020	FY2021
Current fallow	1126	1066	1118
Single cropped	5271	5216	5260
Double cropped	10065	10194	10166
Triple cropped	4594	4613	4594
Quadruple Cropp	43	56	53
Net cropped	19973	20081	19972
Gross cropped	39357	39678	39493

3.4. Production of Agricultural Commodities

Despite stability in land use for agricultural production, agricultural output has shown consistent improvement over the last thirty years. The crop production index increased fourfold, rising from 32.1 in 1973 to 119.1 in 2022, primarily due to the expansion of rice, wheat, tobacco, fibres, vegetables, and potato cultivation [35].

Rice accounts for approximately 92% of the total food grains produced in the country and occupies about 77% of agricultural land [5]. Figure 5 shows trends in rice farming, indicating that higher boro rice production was achieved on a smaller land area, thanks to improved yields. The limited area and output of Aus rice cultivation, which constitutes only 9.1 percent of the overall rice-cropped area, indicate the potential for both area and yield enhancements in Aus rice. There is also potential to expand both the acreage and the yield of Aman rice. Self-sufficiency in rice production has not yet been achieved, as a domestic demand gap of 2-3 percent remains, filled by rice imports [19].

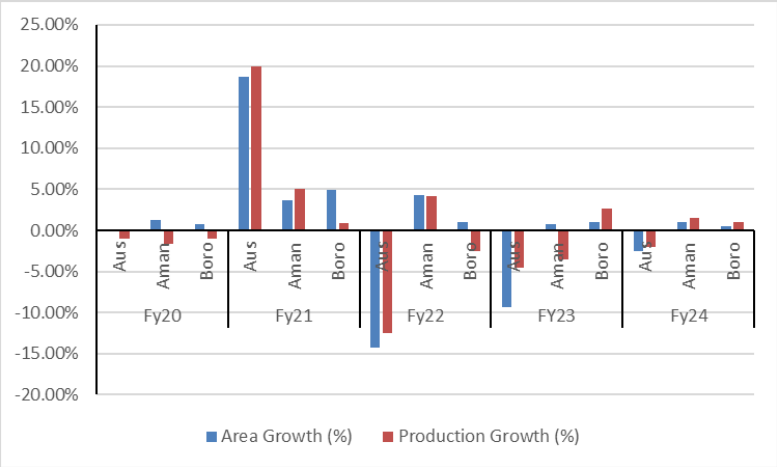


Figure 5. Growth rate in production and area of cultivation of rice (yearly% changes) [19].

3.4.1. Wheat

In FY2023, wheat production totaled 1.2 million metric tons, marking a rise of 7.7 percent in comparison to FY2022 (Table 6).

Table 6. Wheat production [19].

Fiscal Year	Area ('000 acres)	Production ("000 m ton)	Import ('000 m ton)	Yield (ton/acre)	Share of import of total domestic production
FY19	816	1017	5629	1.25	554.0
FY20	821	1029	6435	1.34	317.2
FY21	878	1299	5343	1.48	492.4
FY22	778	1086	4012	1.40	369.4
FY23	783	1170	1912	1.49	
Average changes in five years	-1.9	1.3	-11.6	3.5	

3.4.2. Vegetables

Vegetable production for both summer and winter seasons has seen an increase in recent years (Table 7).

Table 7. Vegetables that are produced in the summer season (in lakh MT) [8].

Fiscal Years	Vegetables (summer)	Vegetables (winter)
FY20	13.5	31.3
FY21	14.0	32.7
FY22	15.5	34.5
FY23	17.0	36.7
Annual average growth	6.5	4.3

3.4.3. Fruits

The following table presents the production trends of major seasonal and perennial fruits in Bangladesh from FY2020 to FY 2023.

Table 8. Production of fruits (temporary) (in Lakh MT) [8].

Types	Fruits	FY20	FY21	FY22	FY23	Annual average growth rate
Temporary	Banana (Ripe)	8.2	8.3	8.0	8.4	0.7
	Watermelon	2.5	3.5	5.5	5.6	29.5
	Pineapple	2.2	2.1	2.1	2.0	-2.4
	Water Fruit	0.0	0.0	0.0	0.0	19.2
	Strawberry	0.0	0.0	0.0	0.0	28.7
Permanent	Mango	12.2	12.1	12.1	14.8	5.3
	Jackfruit	10.0	11.0	10.5	10.6	1.5
	Green Coconut	4.5	4.4	4.6	4.6	0.6
	Guava	2.3	2.4	2.4	2.6	3.3
	Ripe Papaya	1.3	1.3	1.5	1.5	2.8
	Lichi	0.8	0.9	0.9	1.0	7.3
	Lime & Lemon	0.6	0.8	1.0	1.0	17.7

3.4.4. Livestock

The number of livestock is increasing, with statistics showing steady growth across all recorded livestock species in the last five years. This positive trend in livestock populations has led to an increase in the output of dairy and meat products. From FY2019 to FY2023, the yearly average growth rate for chicken and duck production outpaced that of other species.

Table 9. Livestock population of Bangladesh (in lakh numbers) [16].

Fiscal Year	Cattle	Buffalo	Sheep	Goat	Chicken	Duck
FY19	242.4	14.9	35.4	262.7	2893	578
FY20	243.9	14.9	36.1	264.4	2966	597
FY21	245.5	15	36.8	266	3041	617
FY22	247	15.1	37.5	267.7	3118	638

Fiscal Year	Cattle	Buffalo	Sheep	Goat	Chicken	Duck
FY23	248.6	15.2	38.3	269.5	3197	660
Annual Average Growth Rate	0.5	0.4	1.6	0.5	2.1	2.9

3.5. Disbursement and Recovery of Agricultural Credit

To improve food security and support the agricultural sector along with rural communities, loans for agriculture and rural development are being distributed through banks and financial institutions. Bangladesh Bank has formulated expanded policies and initiatives for agricultural and rural credit to facilitate the more straightforward disbursement of these loans.

Table 10. *Year-wise Disbursement and Recovery of Agricultural Credit [5].*

Fiscal Year	Target	Disbursement	Recovery	Balance
2016-17	17550.00	20998.70	18841.16	39047.57
2017-18	20400.00	21393.55	21503.12	40601.11
2018-19	21800.00	23616.25	23734.32	42974.29
2019-20	24124.00	22749.03	21245.24	45592.86
2020-21	26292.00	25511.35	27123.90	45939.80
2021-22	28391.00	28834.21	27463.41	49802.28
2022-23	30911.00	21066.51	20985.53	51234.84

3.6. Distribution of Margin at the Retail Market

The rice market has seen fluctuations in retailer margins, which increased from 7 percent in 2018 to 54 percent in 2020, though these margins have since stabilized at around 5-6 percent in 2021 and 2022 (Table 11).

Table 11. *Distribution of margin at the retail market and wholesale market (in%) [15].*

Name of item	Market	2018	2019	2020	2021	2022
RICE						
Rice (Coarse)	Retail	7	9	54	5	6
Rice (Medium)	Retail	5	6	6	6	5
Rice (Thin)	Retail	6	6	-7	6	5
CROPS						
Wheat	Wholesale	8	7	4	-7	-21
	Retail	9	8	12	11	5
Maize Crop	Wholesale	9	0	4	-16	0
	Retail	16	17	21	14	9
Tomato	Wholesale	40	19	2	2	8
	Retail	24	23	23	26	25
Lentil	Wholesale	29	21	32	32	22
	Retail	11	11	7	6	8
Potato	Wholesale	5	5	7	11	-14
	Retail	25	27	17	19	22
SPICES						

Name of item	Market	2018	2019	2020	2021	2022
Onion	Wholesale	5	5	7	11	-14
	Retail	17	13	12	12	15
Garlic	Wholesale	10	-21	25	32	-36
	Retail	24	16	15	11	21
Ginger	Wholesale	7	-2	37	14	-33
	Retail	18	15	2	15	23
Turmeric	Wholesale	7	9	9	11	-3
	Retail	13	10	11	11	10
Coriander	Wholesale	11	9	8	10	-7
	Retail	24	16	16	15	25
Mustard (Oil Seed)	Wholesale	4	1	7	-9	1
	Retail	18	23	18	17	8

3.7. Performance of Bangladesh Agriculture

Agricultural transformation supports modernization, productivity, nutrition, and economic development in Bangladesh [30]. Bangladesh is among developing nations where population growth rates exceed increases in food production [25]. Although agricultural contribution to GDP declined from 58.4% in FY1973/74 to 12.6% in 2020 [38]. This sector employs nearly 40% of the workforce and plays a crucial role in alleviating poverty and ensuring food security through its connections to other economic sectors. This suggests that the economic impact of ANR extends well beyond what is reflected by agriculture's share of GDP alone [10].

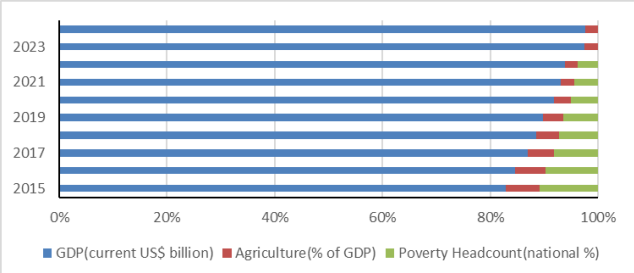


Figure 6. *Bangladesh's Gross Domestic Product, Agriculture, and Poverty, 2015-2024 [38].*

Figure 7 displays the proportion of imports and exports of goods and services in Bangladesh as a percentage of GDP from 2012 to 2023, taking 1990 as the baseline. It shows that the GDP percentage for imports has consistently been greater than that of exports for goods and services.

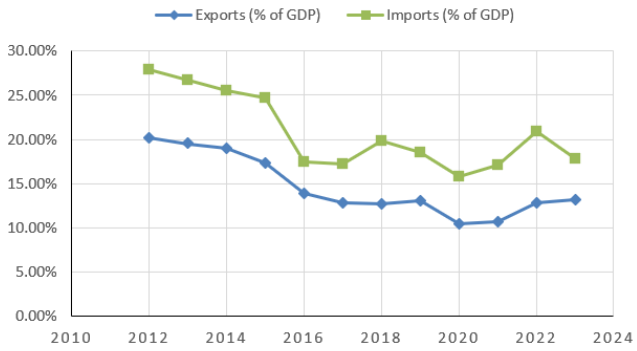


Figure 7. *Export and import of goods and services (% of GDP) in Bangladesh over the last 12 years [37].*

According to Table 12, the transition of contributions from the agricultural sector to the industrial sector regarding GDP has been taking place in FY 2022-23.

Table 12. Trend of Structural Transformation of Broad Sectoral Shares in GDP and Growth Rate at Constant Prices [17].

Share (in percent)															
Sector	1985-86	1990-91	1995-96	2000-01	2005-06	2010-11	2013-14	2014-15	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23*
Agriculture	31.15	29.23	25.68	25.03	19.01	18.01	16.50	16.00	13.62	13.14	12.56	12.52	12.07	11.61	11.20
Industry	19.13	21.04	24.87	26.20	25.40	27.38	29.55	30.42	32.98	33.85	34.99	34.94	36.01	36.92	37.56
Service	49.73	49.73	49.45	48.77	55.59	54.61	53.15	53.58	53.40	53.01	52.45	52.54	51.92	51.48	51.24
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Growth (in percent)															
Agriculture	3.31	2.23	3.10	3.14	5.50	4.46	4.37	3.33	3.20	3.54	3.26	3.42	3.17	3.05	2.61
Industry	6.72	4.57	6.98	7.45	9.80	9.02	8.16	9.67	8.27	10.20	11.63	3.61	10.29	9.86	8.18
Service	4.10	3.28	3.96	5.53	6.60	6.22	5.62	5.80	6.37	6.55	6.88	3.93	5.73	6.26	5.84
GDP (At producer prices)	3.34	3.24	4.47	5.41	7.18	6.64	6.15	6.54	6.54	7.34	8.01	3.76	7.00	7.17	6.33

3.8. Key Challenges

Agriculture plays a crucial role in people's livelihoods, job creation, and its influence on GDP. Bangladesh has made notable progress in the agricultural field, particularly in reducing poverty and ensuring food availability.

3.8.1. Population

Population growth is outspacing food production and may reach about 230 million by 2100. Food production could decline slightly to 80 million tonnes, while demand may approach 75 million tonnes. Sustainable practices, higher productivity and supportive policies are therefore essential for food security [31].

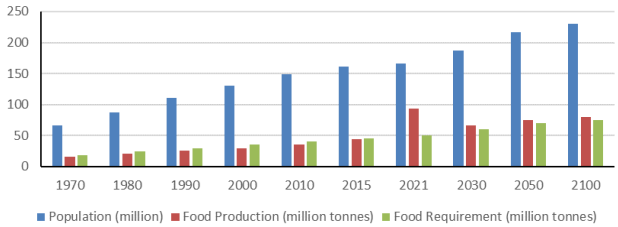


Figure 8. Population versus food production requirement up to 2100 [36].

3.8.2. Loss of Arable Land

Urbanization, housing and infrastructure are steadily converting farmland. Cropland loss increased from 13,413 hectares annually during 1976-2000 to 68,760 hectares during 2000-2010. Agricultural land declined from 9.88 million hectares in 1976 to 8.33 million hectares in 2021 [11].

3.8.3. Climate Vulnerability

Bangladesh faces cyclones, floods, drought, rising temperatures, sea-level rise and salinity. Average temperature is increasing by approximately 0.2 ℃ per decade, while salinity threatens surface water, ground water, agriculture and ecosystems [3, 28]. Additionally, the salinity of both groundwater and surface water may rise quickly due to sea level elevation driven by climate change (8th FYP 2021-2025).

3.8.4. Land and Soil Degradation

Land degradation refers to a decline in the productive potential of the land. In Bangladesh, there are six main types of land degradation: soil erosion, salinity, water-logging, reduction of soil fertility, and contamination with heavy metals. It is estimated that soil erosion in hilly areas impacts around 1.7 million hectares, salinity affects 1.06 million hectares, acidification impacts 3.96 million hectares, and water-logging affects 2.6 million hectares [33].

3.9. Constraints and Opportunities

The constraints and opportunities, identified through various regional workshops, are presented below according to the administrative division.

3.9.1. Khulna Division

It has 10 districts - Khulna, Bagherhat, Sathkhira, Jashore, Magura, Jhenaidah, Narail, Kushtia, Chuadanga and Meherpur. It contains both coastal and plain lands.

Table 13. Constraints and opportunities of Khulna division [6].

Constraints	Opportunities
1. Saline soil and saline river water hinder crop productivity in the region	Adoption of saline tolerant crops and crop varieties and management practices Adoption of CA (conservation agriculture) Scope of organic farming in ghers Excavation of canal for storage of rain water (policy)
2. Farmers use unbalanced dose of fertilizers	Impart farmer's training and field demonstration Scaling of ICT tools
3. Paucity of soft loan for spice crop cultivation.	Provision of enough credit at low- interest rate for spice crop farmers
4. Lack of seed storage facilities (cocoons) and seed drying equipment (during monsoon season)	Ensuring supply of sufficient cocoons and seed drying equipment to seed- producing groups
5. Shortage of seeds of wheat blast and rice blast-resistant varieties	Strategy to enhance seed availability (policy issue) Develop blast resistant rice and wheat varieties

3.9.2. Rajshahi Division

It consists of 8 districts- Rajshahi, Natore, Bogra, Pabna, Sirajganj, Naogaon, Chapainawabganj and Joypurhat. It contains plain land, terraces, and char lands.

Table 14. Constraints and opportunities of Rajshahi division [6].

Constraints	Opportunities
1. Low soil pH	Liming of acid soils having pH below 5.0, at 1 t/ha dololime
2. Low soil organic matter	Conservation Agriculture (CA) practice Legume based crop rotation
3. Fallow land during rabi season	Cultivation of pulses e.g. chickpea, lentil, etc.
4. Pest and disease infestation of mango	Adoption of preventive and control measures
5. Lack of farmers' awareness regarding modern crop production technologies	Arrangement of pertinent training and block demonstration (policy issue)

3.9.3. Barishal Division

It has six districts - Barishal, Barguna, Bhola, Jhalokati, Pirojpur and Patuakhali. All are lying in the coastal zones.

Table 15. Constraints and opportunities of Barisal division [6].

Constraints	Opportunities
1. Climate vulnerabilities - consequences as tidal surge, cyclones etc.	Development and use of climate smart technologies
2. Poor management of polders and sluicegates	Management of polders and sluicegates by coastal community (policy)

Constraints	Opportunities
3. Soil and water salinity	Establish rain water harvest reservoir and excavation of canals for sweet water conservation, and irrigation (policy) Adoption of salt tolerant varieties
4. Low cropping intensity	Adoption of short duration salt tolerant crops, relay cropping (e.g. T. Aman rice - Grasspea) Potato, garlic and sunflower cultivation under zero tillage system Maize and sunflower cultivation through dibbling
5. Lack of farmers' awareness and capacity building	Enhance capacity building and awareness of the coastal farmers by training and field demonstration

3.9.4. Chattogram Division

It has 11 districts - Chattogram, Cox's Bazar, Rangamati, Bandarban, Khagrachhari, Feni, Lakshmipur, Comilla, Noakhali, Brahmanbaria, and Chandpur. It contains hills, coasts, char, and plain lands.

Table 16. Constraints and opportunities of Chattogram division [6].

Constraints	Opportunities
1. Long dry season, poor irrigation system, and limited surface water in hilly areas	Watershed management Drip irrigation, sprinkler irrigation, mulching film etc. Growing spices (zinger, turmeric, bayleaf, cinnamon, black pepper etc.) in fringe lands using surface water irrigation from creaks and streams
2. Low cropping intensity (129%) and low crop yield in hilly areas	Breeding HYVs crops varieties for jhum cultivation Growing short duration vegetables Grow fruits (mango, citrus, papaya etc.) and vegetables in higher traced land and hill slopes
3. Soil erosion in hilly areas	Promote Village Community Forest (VCF) in the hilly areas Improve jhum cultivation or find alternate to jhum cultivation
4. Poor marketing facilities in hilly areas	Establish fruit processing plant unit with cool chamber facilities Establish community based agriculture marketing system Establishment of improved market linkage
5. Salinity in coastal areas (Feni, Noakhali, Laksmipur, Cox's Bazar)	Development and adoption of salt tolerant varieties and management practices

3.9.5. Rangpur Division

It consists of eight districts- Rangpur, Gaibandha, Nilphamari, Kurigram, Lalmonirhat, Dinajpur, Thakurgaon, and Panchagarh. It contains plain land, piedmont, black Terai, and charlands.

Table 17. Constraints and opportunities of Rangpur division [6].

Constraints	Opportunities
1. Low cropping intensity with two crops based cropping pattern	Increase cropping intensity Boro - Fallow - T. Aman rice can be replaced by Mustard - Boro -T. Aman rice
2. Ignorance of farmers on modern farming systems	Promoting modern farming practices e.g. CA
3. Low availability of quality seeds	Strategy development for promoting availability of quality seed
4. Minimum irrigation facility with minimum number of	Expand Government subsidy on irrigation pump (policy issue)

Constraints	Opportunities
irrigation pumps	Increase irrigation pumps, with subsidy on diesel and provide electricity in char areas (policy issue)
5. Inadequate cold storage facility	Establish cold storage with government loan at minimum interest (policy)

3.9.6. Sylhet Division

It has four districts - Sylhet, Habiganj, Moulvibazar, and Sunamganj. It contains diversified landscape - haors, hills, and plain lands.

Table 18. Constraints and opportunities of Sylhet division [6].

Constraints	Opportunities
1. Low cropping intensity with two crops based cropping pattern	Increase cropping intensity by inclusion of a new crop in the pattern (example, Boro - Fallow - T. Aman rice to be replaced by Mustard - Boro -T. Aman rice)
2. Flash flood in April affects Boro crop and Seasonal flood damages different crops	Early transplantation of Boro rice, preferably in December Promote sac gardening technology Promote floating garden and Sorjan farming
3. Cold injury in Boro season	Development of rice varieties with cold tolerance tarits
4. Lack of sufficient credit facilities	Strengthen loan support with a small interest from credit organizations (policy issue) PPP (Public-Private Partnership) efforts to be paid for resource allocation
5. Soil erosion in hilly areas	Contour planting Establish agroforestry/horticulture, no tilling on slopes, grow hedge plants eg, leguminous shrubs/trees across the slopes

3.9.7. Mymensingh Division

It has four districts - Mymensingh, Netrakona, Jamalpur, and Sherpur. It contains plain land, charland and hills (very small area).

Table 19. Constraints and opportunities of Mymensingh division [6].

Constraints	Opportunities
1. Low soil pH in 30% land (Haluaghat)	Application of dololime to correct soil pH
Rice-Fallow-Rice is the dominant cropping system	Inclusion of mustard or legume after harvest of short duration T. Aman rice Introduction of Conservation Agriculture (CA) practice, which will allow the second crop after T. Aman harvest
3. Drought in char land during rabi season	Cultivation of low water requiring crops Cultivation of dry seeded rice (DSR) Expansion of irrigation facilities
4. Low water holding capacity (WHC) of light textured soils	Use of biochar to increase water holding capacity) Cultivation of green manure (GM) crops
5. Riverbank erosion	Use of soil erosion mats or blankets (made of stabilization fabric)

3.9.8. Dhaka Division

It has 12 districts - Dhaka, Faridpur, Gazipur, Gopalganj, Kishoreganj, Madaripur, Manikganj, Narayanganj, Narsingdi, Rajbari, Shariatpur and Tangail. It contains industries, terraces, hair, and plain lands.

Table 20. Constraints and opportunities of Dhaka division [6].

Constraints	Opportunities
1. Medium cropping intensity (199%);	Promote cultivation of short duration crops and varieties Encourage multiple cropping, inter- cropping, relay cropping and mixed cropping
2. Industrial discharge (effluent) polluting land and crops	Industries must follow the government rules for management (policy) Recycling of water discharge for use in urban agriculture.
3. Pest (insect and disease) infestation	Develop and use of pest tolarant crop varieties Use of bio-pesticides and bio-rational based IPM system
4. Scarcity of HYV quality seeds	BADC should be pro-active for increasing seed availability (policy issue)
5. Non-judicial use of fertilizers	Farmers' awareness could be improved through training and use of social media

3.10. Government Policy

In recent times, the Government of Bangladesh has implemented a range of strategic plans, policies, and regulations that set forth ambitious goals for the upcoming decades. These strategies all emphasize the importance of modernizing agriculture, strengthening resilience against climate challenges, and sustainably managing natural resources. Moreover, these policies illustrate the government's commitment to achieving the Sustainable Development Goals [2]. Various forms of urban agriculture, including rooftop gardening, vertical farming, and homestead gardening, can be utilized [26].

3.10.1. Perspective Plan 2041

The Perspective Plan for Bangladesh 2021-2041 is designed to eradicate poverty in the country and achieve high-income status by the year 2041 [24]. This plan highlights the necessity of modernizing agriculture, fisheries, and livestock through diversification and climate resilience to secure food and nutritional stability. This structural transformation depends on enhancing human capital and skills aligned with the nation's current and future needs.

3.10.2. Bangladesh Delta Plan 2100**

The Bangladesh Delta Plan 2100 is an extensive, long-term framework designed to guide the country's water management strategies until the end of the century [23]. The plan emphasizes the importance of water management in urban and rural regions across all economic sectors, particularly in agriculture, while evaluating various scenarios of climate change impacts. This ambitious initiative outlines six national goals:

1) guaranteeing safety from floods and other climate-related disasters.
2) improving water security and the efficiency of water use.
3) ensuring sustainable and integrated management of river systems and estuaries.
4) preserving and protecting wetlands and ecosystems while promoting their sustainable use.
5) building effective institutions and equitable governance for managing both domestic and transboundary water resources; and
6) achieving optimal and integrated usage of land and water resources.

Importantly, the plan includes a financial strategy that comprises 65 physical projects and 15 initiatives aimed at institutional and knowledge enhancement, amounting to a total capital investment of $34.78 billion.

3.10.3. Eighth Five-Year Plan

Every five years, the Bangladeshi government creates a plan that addresses the most pressing issues related to the country's short-term development. In December 2020, the Eighth Five-Year Plan 2020-2025 was unveiled [23]. This plan aligns with the Perspective Plan for Bangladesh 2021-2041 and the Bangladesh Delta Plan 2100, focusing on improving successful existing practices in water conservation and management, integrated water management (which includes flood control and prevention strategies), early warning systems for floods and cyclones, and enhancements in irrigation (including effective natural resource management and improving livelihoods in coastal areas). The strategic priorities in agriculture take a holistic approach to ensure food security and nutrition by increasing productivity, narrowing yield gaps, stabilizing prices of agricultural commodities, enhancing farmers' profitability, managing financial risks, diversifying production of high-value crops (HVC), adding value, strengthening agricultural supply chains, and promoting fisheries [23] and livestock production.

4. Conclusion

The research indicates that agriculture remains crucial for

driving economic advancement, securing food supplies, creating jobs, and sustaining rural communities, even as the country transitions gradually towards industrial and service sectors. Examination of GDP growth patterns, sectoral distribution, and structural changes shows that although the agriculture sector's share of GDP has declined over time, its absolute value has risen considerably, indicating consistent productivity improvements and diversification across crop, livestock, and horticultural activities. Data on land utilization, crop productivity, and livestock numbers illustrate the sector's resilience and significance in meeting national food needs, particularly amid population growth and vulnerable ecosystems. Insights into agricultural financing and market frameworks reveal both opportunities and systemic obstacles, notably inefficiencies in price transmission, limited access to modern technologies, and susceptibility to global market shifts. Regional evaluations further highlight that challenges differ across areas, including soil salinity, climate change impacts, insufficient infrastructure, and resource distribution.

The regional assessment demonstrates that agricultural constraints vary considerably across divisions, with coastal areas mainly affected by salinity and climate risks, flood-prone regions facing water-related challenges, and other regions experiencing limitations in irrigation, input availability, and market infrastructure. These findings suggest that agricultural policies should adopt region-specific strategies rather than uniform interventions. Strengthening climate-resilient technologies, improving irrigation and market infrastructure, expanding access to agricultural credit, promoting high-value crop diversification, and enhancing value-chain integration should be prioritized to improve agricultural sustainability and competitiveness.

Nevertheless, there are opportunities to adopt technology, integrate markets, and implement policy measures to boost productivity and sustainability. In summary, the results emphasize that agriculture continues to be a fundamental element of Bangladesh's economy; its modernization, diversification, and effective connection with industry and commerce will be vital for maintaining economic growth, alleviating poverty, and achieving long-term developmental objectives.

This study is based on secondary data from available national and international sources; therefore, variations in data definitions, reporting periods, and availability across sources may limit direct comparisons of some indicators. Future research could incorporate primary-level farm data and advanced econometric approaches to examine the causal relationships between agricultural transformation, productivity growth, climate adaptation, and farmers' economic outcomes.

Abbreviations

ADB	Asian Development Bank
ANR	Agriculture and Natural Resources
BADC	Bangladesh Agricultural Development Corporation
BARC	Bangladesh Agricultural Research Council
BBS	Bangladesh Bureau of Statistics
BDT	Bangladeshi Taka
CA	Conservation Agriculture
COVID-19	Coronavirus Disease 2019
CPD	Centre for Policy Dialogue
DAM	Department of Agricultural Marketing
DLS	Department of Livestock Services
DSR	Dry Seeded Rice
FPMU	Food Planning and Monitoring Unit
FY	Fiscal Year
FYP	Five-Year Plan
GDP	Gross Domestic Product
GM	Green Manure
GNI	Gross National Income
HVC	High-Value Crops
HYV/HY Vs	High-Yielding Variety/High-Yielding Varieties
ICT	Information and Communication Technology
IMF	International Monetary Fund
IPM	Integrated Pest Management
MoA	Ministry of Agriculture
MoP	Ministry of Planning
MPS	Monetary Policy Statement
MT	Metric Tons
PPP	Public-Private Partnership
SRDI	Soil Resource Development Institute
UNEP	United Nations Environment Programme
USD	United States Dollar
VCF	Village Community Forest
WHC	Water Holding Capacity

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Conflicts of Interest

The authors declare no conflicts of interest.

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