Bangladesh Journal of Political Economy

Vol. 38, No. 2, December 2022, pp. 143-174
Bangladesh Economic Association
(ISSN 2227-3182)
http:/doi.org/10.56138/bjpe.dec2208

Evaluation of Agricultural Policies and its Impact on Agricultural Development in Bangladesh

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Abstract

Agricultural policies strive to improve agricultural welfare by ensuring agricultural development, raising productivity, enhancing food safety and security, safeguarding and improving natural and biological resources, and building producer organisations. The major influence of agricultural policy on agricultural growth is establishing national self-sufficiency in food production, boosting farm family living standards, conserving agricultural resources, and minimising population pressure in the agricultural sector. Agriculture provides approximately 15% of GDP, with the crop sub-sector contributing 9%. Various agricultural organisations, including the Bangladesh Agricultural Research Council, BADC, were formed and resurrected under the direct supervision of the Father of the Nation, Bangabandhu Sheikh Mujibur Rahman, and the breadth and dynamics of the agricultural extension service were expanded. The agriculture industry is critical to Bangladesh's overall economic development. According to the Quarterly Labour Force Survey 2020, the agricultural industry (crops, animal farming, forests, and fishing) produces 14.74 percent of the country's GDP and employs approximately 41 percent of the labour force. Rice currently covers about 75 percent of the cultivated land in Bangladesh. Area coverage by other crops is as follows: pulses (4.64%), wheat (3.92%), oilseeds (3.77%), jute (3.71%), sugarcane (1.23%), potato (1.11%), fruits

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(0.84%) and vegetables (1.39%). Agriculture's sectoral contribution has been dropping over time, with the service sector capturing the lion's share in the early 1980s. With the rapid rise of the industrial sector, the service sector began to thrive and rose to first place in Bangladesh. Even though the population has doubled from 70 million to 180 million, agricultural productivity has increased sufficiently to sustain this population. Over the previous three and a half decades, Bangladesh's agriculture has undergone substantial structural changes and achieved significant success.

Keywords: *Policy · development · growth · environment and productivity*

Introduction

Agriculture is the backbone of Bangladesh's economy. The country's agro-based industries rely heavily on it for raw supplies. The bulk of people's source of food and nutrition, jobs, and income creation. It is the primary economic activity of the rural poor to alleviate poverty. Many of us regard it as the lifeblood of Bangladesh's rural economy. This sector, however, is threatened by a 1% annual decline in productive land. Land quality is degrading due to soil fertility degradation. Water resources are also diminishing as a result of massive water uplift. Our government's challenge is to conserve precious resources, enhance raw material availability, boost food production and decrease poverty. Agriculture is the only option for meeting the issues. Agriculture must expand at least 4% yearly to keep the GDP growth rate at 6-7%. Agricultural modernisation and the linkage of supply chains between producers and consumers in domestic and international markets may make it possible. As a result, national policies relevant to the current agro-economic setting must be revised and updated. Agriculture employs approximately 41 percent of the entire labour force in the country. Agriculture provides approximately 15% of GDP, with the crop sub-sector contributing 9%. Various agricultural organisations, including the Bangladesh Agricultural Research Council, BADC, were formed and resurrected under the direct supervision of the Father of the Nation, Bangabandhu Sheikh Mujibur Rahman, and the breadth and dynamics of the agricultural extension service were expanded. As a result, the country attained food grain self-sufficiency. As a result of the advancement of modern kinds and technology, many fruits and vegetables are produced with improved production throughout the year. Modernisation of agriculture has been prioritised in various agricultural policies to accomplish poverty reduction, food and nutrition security, and agricultural expansion.

Objective

Agricultural policies strive to improve agricultural welfare by ensuring agricultural development, raising productivity, enhancing food safety and security, safeguarding

and improving natural and biological resources, and building producer organisations. The overall objective of this study is to evaluate agricultural policies critically and document the visible impacts of these policies. The specific objectives are:

a. to accumulate the policies in the agricultural sector;
b. to document the impacts of agricultural policies in different fields of crops, livestock and fisheries; and
c. to suggest further policy guidelines.

Methodology

The study area was selected based on secondary data to accomplish objectives. The Ministry of Agriculture, Ministry of Fisheries and Livestock, BARC, DAE, DoF, DLS, and NARS have introduced many policies. The evaluation was made after exploring the policies provided by these government bodies, FGD and KII. The implications of these policies were measured by comparing the collected secondary data. Data were collected from the available national secondary sources from November 2021 to April 2022.

National Agriculture Policy, 2020

Crop Production Policy

Although the intensification of food grain production, especially the rice-based production system, is profitable from the farmers' point of view, this approach has appeared to be harmful in protecting land productivity. Rice currently covers about 75 percent of the cultivated land in Bangladesh. Area coverage by other crops is as follows: pulses (4.64%), wheat (3.92%), oilseeds (3.77%), jute (3.71%), sugarcane (1.23%), potato (1.11%), fruits (0.84%) and vegetables (1.39%) The production system dominated by a single crop (i.e. rice) is neither scientific nor acceptable from the economic point of view. It is, therefore, necessary to increase the cultivation and production of other crops. However, considering the increasing demand for food grains and to ensure food security, the production of rice will continue to be a priority in food grain production programs. In order to increase rice production, supportive programs will be implemented to raise per hectare yield through modem technology and improved cultural practices along with the increased use of HYV seeds.

In Bangladesh, only 4.14 percent of net cultivable land remains fallow, which means that there is hardly any scope for increasing cultivable land. Currently, cropping intensity is around 185 percent. Thus, the only possible option for increasing agricultural production is to increase both cropping intensity and yields simultaneously.

Crop diversification is one of the significant components of crop production policy. Particular emphasis will be placed on crop diversification programs under the crop production policy for the overall development of the crop sector. The government policies in this respect are as follows:

The area under wheat has meanwhile reached 0.8 million hectares. Given the potential for expanding wheat acreage, efforts will continue encouraging farmers to grow more wheat. The production of maize has shown prospective results in the last two years. Maize has also gained popularity as a human food alongside poultry feed. Public sector procurement of maise, like rice and wheat, has been introduced to encourage farmers to cultivate maize. The efforts to increase the area and production of maize will be strengthened. The program for increasing the area and production of other crops, e.g., potatoes, pulses, oil seeds, vegetables, fruits and spices, will gradually be extended under the crop diversification program. Production of different cash crops, including jute and cotton, will be increased, and efforts will be made to expand their multiple uses. Special development programs will be taken to increase the production of potential crops suitable for the coastal areas and the hill tracts. The production of crops, especially *aman* crops, is heavily damaged yearly due to the inadequate soil moisture regime prevailing in drought-affected areas. To combat this situation, the government has adopted the following policies:

- Supplementary irrigation will be ensured in severe and extremely severe drought affected areas.
- Suitable crops for specific locations (including hill tracts) will be identified based on technological and economic parameters, and appropriate strategies will be pursued for cultivating those crops.
- Measures will be taken to minimise post-harvest losses by introducing appropriate technologies.

Seeds

At present, only a tiny portion of the required quality seeds for different crops is supplied by the Bangladesh Agricultural Development Corporation (BADC). The rest of the seeds are produced, preserved, and used by private management, especially at the farmers' level. The government has already declared the National Seed policy to promote the seed industry in the private sector. In pursuance of the seed policy, the government has revised the Seed Act of 1977 and formulated seed rules in light of the Seed Act (Amendment) 1997. In this respect, the government will follow the policies mentioned below:

- In light of the prevailing seed act and seed rules, the government will retain the opportunities already provided to the private sector for seed production, import, and marketing alongside the public sector.

- An appropriate mechanism will be devised to improve the private sector's technical skills in seed treatment, seed preservation at a specific moisture level, and seed storage management so as to ensure the highest quality of seeds.
- The act of favourable policy preparation, technical support, training, etc., will be strengthened to encourage private sector participation in seed development and preservation.
- Improved technology-based seed production, seed multiplication, and related farm activities have been declared industrial enterprises in the present industrial policy. This policy will be continued, and adequate government support will be provided for the development of the seed industry.
- In addition to producing and marketing seeds in the public and private sectors, the policies relating to seed production and preservation at the farmers' level will continue so that the farmers can easily use good quality seeds. The government has, meanwhile, taken the initiative to strengthen the activities of BADC in this regard. During the Fifth Five Year Plan period, necessary steps will be taken to raise BADC's seed distribution programme to ten percent of the total demand.
- The already introduced seed buffer stock system will continue to ensure the normal supply of seeds of major crops during natural calamities or other disasters.
- The conditional opportunity that has already been given to the private sector to import hybrid rice seeds to increase rice production will be further consolidated based on performance analysis. However, special care will be taken to ensure that the private sector produces hybrid seeds locally and that the hybrid seeds offer higher yields and more financial benefits to the farmers on a sustained basis.
- At present, the Seed Certification Agency (SCA) is the only legal authority to certify seeds. To increase the supply of quality seeds, private sector agencies participating in the seed production programmes will be allowed to market their 'truthfully labelled *seeds'* alongside government agencies. The Seed Certification Agency will have the legal authority and responsibility to closely monitor the respective private sector organisations' entire seed labelling and certifying process. The Seed Certification Agency will become a member of the International Seed Testing Association (ISTA) to create opportunities for exporting internationally standard seeds.

Fertilisers

Chemical fertiliser is one of the main inputs required to increase crop production. The expansion of modern agricultural practices and intensified cultivation have led to an increasing demand for fertilisers. It is, therefore, necessary to ensure a timely supply of fertilisers to match the demand. As a result of the unbalanced use of fertilisers, land fertility is declining on the one hand, and the potential yield is not achieved on the other. In this respect, it is essential to adopt and implement such policies to encourage farmers to use balanced fertilisers and, at the same time, protect soil fertility.

Minor Irrigation

Irrigation is the leading input for increasing the yield and production of food grains and other crops. About 90 percent of the total irrigated area of the country is covered by minor irrigation. A well-planned irrigation management program is, therefore, essential for gradually increasing cropping intensity and yield. It is against this background that the National Agriculture Policy has given special emphasis on the development of minor irrigation.

As a result of liberal importation of irrigation equipment, shifting of irrigation management to the private sector and withdrawal of siting restrictions and standardisation of irrigation equipment, the total area irrigated and the number of irrigation equipment have significantly increased, which has appeared to be the driving force for increasing production of food crops, especially rice and wheat. However, the major source of irrigation expansion has been the groundwater technologies, predominantly Shallow Tubewell; irrigation by Deep Tubewell has virtually not increased in recent years. Although there is much prospect for surface water irrigation, it has not been expanded to 'any significant scale. Instead, the withdrawal of siting restrictions and standardisation of irrigation equipment has negatively impacted the efficiency of irrigation management. For example, in some places, a much larger number of equipment has been installed than technically required, and many of those installations have turned out to be physically and technically inappropriate. Such phenomena have resulted in capacity underutilisation of pumps and increased the cost of irrigation, increasing production costs. In this respect, appropriate steps will be taken to develop and extend minor irrigation systems in light of the National Water Policy and Water Resources Development Plan.

Although minor irrigation is mainly in the domain of the private sector, the onus of improving irrigation efficiency still lies with the government. In this context, the primary goal of minor irrigation management under the purview of Agriculture Policy is to accelerate crop intensification and increase yields

through planned utilisation of surface and groundwater in an environment-friendly atmosphere. To achieve this goal, activities of various agencies involved in surface and groundwater irrigation programs will be coordinated at the national level. Specifically, the following steps will be taken to strengthen irrigation management:

- Efforts will be made to reduce irrigation costs by improving irrigation efficiency, promoting appropriate technology, increasing irrigation command area and upgrading irrigation management.
- Irrigation from surface water will be a priority, and suitable programmes will be developed to expand and consolidate appropriate technology. Emphasis will be given to the conjunctive use of ground and surface water in accordance with the government's National Water Policy and Water Resources Development Plan.
- Infrastructures will be built to capture surface water from khals, beels, and small rivers, and the availability of irrigation water will be increased by using high-capacity power pumps. Besides, small rivers, khals, dighi, derelict ponds, etc., which have been silted up, will be re-excavated to augment water flow for expanding irrigation facilities. Such water bodies will be used for fish production while tree plantation will be done on the two sides of the khals.
- Since irrigation by electrically operated equipment is cheaper and more efficient, priority will be given to electricity connections and supplies for irrigation pumps.
- In severely and extremely severe drought-affected areas, the government's decision to strengthen supplementary irrigation during the transplanted aman season will continue. Also, required technical support for electricity reconnection to irrigation pumps during the *aman* season will be provided along with other forms of assistance.
- Special location-specific programmes will be undertaken to improve the irrigation system. Irrigation programmes will be undertaken following proper strategy according to surface and groundwater availability. Farmers will be motivated to harvest rainwater for irrigation, and appropriate programmes will be taken to promote rain-fed farming. Suitable projects will be undertaken to build water reservoirs to capture tidal water and expand mechanised irrigation facilities in the coastal areas. In this regard, participatory programmes for the local beneficiaries will be undertaken.
- In backward and underdeveloped areas, the government will initially implement irrigation programmes. Gradually, the private sector will be motivated and provided with the necessary support to develop ways and

means of expanding irrigation, as well as to market and install appropriate irrigation technologies.

- Private sector initiatives for repairing and maintaining irrigation equipment at the local level will be encouraged further. Special programmes will be undertaken to provide technical assistance for increasing technical competence, including credit support for promoting mechanics' services at the local level.
- The farmers will receive necessary training and technical assistance to reduce water loss through increased irrigation system efficiency and increased command areas per pump.
- To ensure optimum water usage, the intensity of crop production will be increased through a crop diversification programme based on the identification of suitable cropping patterns. Under the programme, farmers will be motivated by the introduction of suitable irrigation methods for growing different crops.
- The irrigation management system will be regularly monitored, and the required data will be collected and analysed to provide guidelines for improvement. Adequate steps will be taken to deliver information on irrigation equipment regularly to farmers and traders who are investing in it.
- Coordinated steps will be taken in collaboration with the concerned agencies to effectively monitor how underground water levels fluctuate over time and what possible impact this might have on irrigation development in the future.
- Measures will be taken to minimise any adverse impact of the withdrawal of siting and standardisation requirements by properly advising the farmers and creating awareness about the technical and financial implications of the dense installations of irrigation equipment.
- Research will be strengthened to assess the present status and determine future programmes on the availability of irrigation water, the use and impact of irrigation technologies, etc.
- Reservoirs will be built up to tap water from the year-round stream flow in hilly areas, and appropriate infrastructure will be developed for irrigation and fish culture.

Pest Management

Integrated Pest Management (IPM) will be the central policy for controlling pests and diseases. More importance will be given to the following activities for pest

control under the Agriculture Policy:

- Farmers will be motivated to use more pest-resistant varieties of crops. Modern cultivation practices will be followed to reduce the incidence of pest infestation.
- Mechanical control measures such as light traps, hand nets, etc., will be increased and popularised. Biological control measures will be used to destroy harmful insects and preserve useful ones.
- Regular training and discussion programmes on IPM will be conducted among farmers under the supervision of the Union Agricultural Development Committee to successfully introduce and popularise the method at the farmers' level.
- Pest surveillance and monitoring systems will be strengthened.

Chemical pesticides will only be used in cases where IPM fails to control the pests. The following measures will be taken in respect of the distribution and use of chemical pesticides in the light of existing rules and regulations:

- The production, import, distribution, or use of any chemical pesticide that is directly or indirectly harmful to human, animal, or aquatic health.
- Use of any chemical pesticide harmful to the natural environment will be discouraged and eventually banned.
- The system of pesticide approval at the national level will be continued, and its monitoring and testing of the effectiveness of approved pesticides will be strengthened.

Agricultural Mechanization

The severe scarcity of draft power necessitates using mechanical power for agricultural production activities. The government has, therefore, attached particular importance to agricultural mechanisation. To encourage the use of machines in agriculture testing and standardisation, restrictions have already been withdrawn from the free market distribution system. As a result, the use of agricultural machinery has increased significantly, and immense potential has been created for further growth. In order to accelerate the current trend of agricultural mechanisation, various facilities, including the exemption of import duties on agricultural machinery, have been provided, and the same will continue.

The following steps will be taken to promote agricultural mechanisation:

- The type of agricultural machines or the level of mechanisation needed in any region depends on the socio-economic condition of the people, the number and quality of draft animals and the availability of agricultural labour in

that region. Measures will be taken to collect and publicise this information through the mass media to attract private investment in this sector.

- To gradually reduce dependence on draft power, efforts will be made to grow farmers' interest in mechanisation and provide credit facilities. To achieve this goal, information relating to increasing potential demand for and profitable investment in agricultural machinery will be publicised through the mass media so that the private sector can play an active role in creating a competitive market.
- Despite the increasing use of mechanical power in agriculture, animal power will continue in the future depending on the socio-economic conditions of the farmers in different regions. Therefore, an improved 'power delivery system' (meaning delivery of energy from the shoulder of the draft power to the agricultural implement) will be evolved through research so that the scarce draft power can be utilised more efficiently.
- Production and import of agricultural machines will be especially encouraged so that farmers can procure machines from the market according to their choice and convenience. Machinery workshops and industries engaged in agricultural mechanisation activities will be provided with appropriate tax/duty facilities to import necessary raw materials. This is expected to keep machine prices within the farmers' purchasing capacity.
- To speed up the process of agricultural mechanisation, the necessary credit support will be provided to both producers and machine users.
- Individual farmers are not often able to afford the use of expensive machines. To popularise mechanisation in addition to the use of draft power, farmers will be motivated to purchase or lease agricultural machines through cooperatives. Formation of such self-motivated cooperatives will be encouraged, and necessary support will be extended to mechanised cultivation based on cooperatives.

Agriculture Research

A well–coordinated research plan is essential for the rapid development of the crop sector. A two-dimensional agricultural research management program will be followed to transform the crop production system into a profitable and sustainable sector. On the one hand, priorities will be given to developing low-cost appropriate technologies for the small, marginal and medium farmers, including women, to resolve their identified problems. On the other hand, applied research will be strengthened through advanced research methodology by providing necessary research facilities. The following steps will be taken to fulfil the expected goals of agricultural research:

- The social, economic, and marketing research programmes of all the National Agricultural Research Institutes and the Department of Agricultural Marketing (DAM) will be strengthened to determine the economic importance of crop production.
- The government's already established National Agricultural Research System (NARS) will be strengthened and coordinated further through periodic evaluation.
- The programme already undertaken to transfer and popularise the technologies evolved by different agricultural research institutes through the private sector and NGOs at the field level will continue.

National Agricultural Research Institutes will, in principle, give priority to the following subjects in preparing their time-bound and target-oriented research programs:

- Soil and agro-ecological Zone (AEZ) specific research;
- Research relating to the development and application of fertilisers which are harmless for soil quality, environment and health;
- Research on preservation and development of land productivity in different regions;
- Region-wise research on irrigated and rain-fed cultivation;
- Farm management research with a view to minimising production cost and maximising farmers' income;
- Research on identifying different regions of the country from the economic point of view as the most suitable and profitable for specific crops and cropping patterns;
- Research on the preservation of existing bio-diversity of different crops;
- Research relating to IPM and development and application of pesticides from indigenous plants;
- Research on improving the quality and utility of various crops;
- Research on meeting the increasing demand for food-based nutrition through increasing crop diversity;
- Agro-economic research on the trend and impact of domestic and export demands for different crops;
- Research on preservation and processing of crops and reduction of crop losses;
- Research on enhanced participation of women in agricultural activities and removal of constraints;

- Research relating to the development of crop varieties and technologies suitable for drought and flood conditions;
- Research on developing short-duration improved varieties of seeds for different crops;
- Agronomic and economic research on crop diversification;
- Research on the development of improved crop varieties and technologies suitable for cultivation in coastal, hilly, water-logged and salinity-affected areas;
- Research on developing improved varieties and technologies for the deep water rice;
- Research on developing technologies for integrated rice cum fish culture; and
- Research on marketing and price trends of different crops.

Agriculture Extension

The extension of agriculture is one of the main components of the national agriculture policy. There is a need to strengthen agricultural extension services to ensure the proper use of agricultural land and improve land productivity. The Department of Agricultural Extension (DAE) is responsible for providing information on appropriate technologies to the farmers, educating them through proper advice and training, and motivating them to adopt improved technologies. To strengthen the extension mentioned above services, the following steps will be taken:

- The New Agricultural Extension Policy (NAEP) is currently being implemented. Its objective is to promote sustainable technology for the gradual development of an improved crop production system. The implementation of NAEP will be reinforced through necessary monitoring.
- The agricultural research-extension linkage will be further strengthened to transfer new technologies to farmers; private sector entrepreneurs, NGOs, and farmers will also be involved in strengthening this linkage.

The present agricultural extension set-up is sufficiently broad-based and bolstered by efficient workforce. The following measures will be taken to make this organisation more efficient and effective:

- DAE will prepare feasible and compatible programmes for properly using cultivable land based on demand for different crops and their production targets.
- DAE will regularly monitor the supply and availability of quality seeds, fertilisers, irrigation, pesticides, etc., to facilitate the cultivation of

different crops. Besides, DAE will prepare an anticipated report on the increase/decrease of crop-wise demand for different inputs and apprise the authorities at the national level.

- The use of public mass media, such as radio, television, newspaper, etc., will be increased to rapidly extend agricultural technologies. In this connection, the Agriculture Information Service will be strengthened.
- Proper use of Annual Development Plan (ADP) allocations to local government will be ensured. Block-wise establishment of demonstration farms, which is already in practice, will be strengthened. DAE will determine suitable crops that are compatible with the farms' overall conditions. Visits to demonstration farms and interaction with the farmers by the extension workers at an essential time of the respective cropping season will be further strengthened.
- Multiple extension approaches, such as agricultural fairs, field days, farmers' rallies, etc., will be widely practised to facilitate the rapid transfer of agricultural production technologies.
- The extension service of agriculture will be strengthened to encourage a self-motivated cooperative production system.

Agriculture Marketing

Marketing of agricultural commodities is inextricably related to their production. However, the Department of Agricultural Marketing (DAM) remains the weakest of all the existing organisations in the agriculture sector. Markets for agricultural commodities are generally under intermediaries's control, which is very discouraging for the farmers. In preparing marketing programmes, the following points will be taken into consideration:

- Crops will be stored and preserved in proper conditions to ensure uninterrupted supplies throughout the year and cope with crop overproduction. The use of any harmful chemical in this process will be controlled.
- Developing a transportation system will ensure the timely supply of the right quantities of crops at the right places.
- Processing facilities will be developed to reduce the wastage of rapidly perishable crops, increase utility, and maintain the quality of agricultural commodities.
- Grading and standardisation will increase the export of agricultural commodities. To increase local consumption of such crops, necessary measures will be taken for grading, standardisation, labelling, and quality

development according to consumers' tastes, preferences, and food values.

- The proper development of marketplaces and related physical infrastructure will improve the efficiency and effectiveness of marketing programmes.
- Market-related information would be supplied to farmers, traders, and consumers through strengthening the market information service.
- Consumers/users, traders, and processors will be informed about the production, utilisation, processing technology, etc., of new crops.
- Establishing a marketing database and analysing the data will provide necessary assistance in solving marketing problems at the government and non-government levels.
- The Agricultural Commodity Market Control Act of 1964 (revised in 1985) will be updated and implemented.
- To ensure fair prices of crops, measures will be taken to establish a linkage among the producers, traders, exporters and processors through the 'contract sale' of crops.
- Self-motivated cooperative marketing system will be encouraged.
- Necessary output price supports will be provided, and food grain procurement will be strengthened to ensure a fair price of crops during the harvesting season and stabilise prices when crop damage or overproduction occurs.

Land Use

The government has the primary responsibility of ensuring the optimum use of land. Although land is a privately owned property in general, its use has to be compatible with the overall social goals and utility. Moreover, it is crucial to consider that the interests of small, arid marginal farmers and sharecroppers are protected, as they constitute the majority of farmers.

The following steps will be taken to ensure planned utilisation of land for crop production:

- The Soil Resources Development Institute (SRDI) will prioritise the land zoning programme and strengthen its integrated approach.
- To ensure maximum land utilisation, bottom-up planning will be used, with people's participation and implementation starting from the mouza or village level.
- In most areas, the same land is suitable for more than one crop. Therefore, farmers will be encouraged to grow more profitable crops as an alternative to the rice-rice cropping pattern.

- Fertile agricultural land is being lost to cultivation due to its use for non-agricultural purposes such as private construction, house building, brickfields, etc. In light of the government's land policy, appropriate measures will be taken to stop this trend.
- Maximum land utilisation will be ensured by promoting inter-cropping with the main crops.
- Acquisition of land over the requirement for non-agricultural purposes will be discouraged.
- Programmes will be implemented to motivate landowners not to keep their land unused without an acceptable reason.
- Appropriate measures will be taken in light of the Land Policy to protect the interests of small and marginal farmers and sharecroppers and ensure that agricultural land is not kept fallow for an extended period.

Agricultural Education and Training

One specific objective of the Agriculture Policy is to develop efficient manpower in agricultural disciplines to increase the production rate on a sustained basis. Bangabandhu Agricultural University has been established alongside Bangladesh Agricultural University to expand the scope of agricultural education. In the light of the National Education Policy, policies adopted by the government for the expansion of agricultural education and training are as follows:

- Steps will be taken to improve and strengthen the administrative and academic management of agricultural colleges established by the government. Appropriate measures will be taken, if necessary, to facilitate coordination and reforms in the administrative management of these colleges;
- The number of agricultural education institutions will increase to the required level. A pre-determined standard and facilities will be ensured for establishing and managing any agricultural college.
- All the agricultural colleges will be managed according to the curricula and examination rules of the relevant universities. Adequate measures will be taken to facilitate higher studies, research and on-the-job promotion for the teaching staff of agricultural colleges.
- Steps will be taken to strengthen the technical standards, administration, and management of 13 Agricultural Training Institutes (ATI) that offer diploma courses.

In order to make agricultural credit more accessible, a program to advance bank loans at an increasing rate will be implemented. Besides, the Ministry of

Agriculture has prepared an outline of an institution titled 'Agricultural Credit Foundation' following the Palli Karma Shahayak Foundation model to strengthen the agricultural credit system. The Agricultural Credit Foundation will be a non-profit organisation under the Company Act of 1994 with the primary objective of increasing investment in agricultural activities through meeting the demand for credit by the landless, marginal and small farmers and, at the same time to alleviate, poverty and raise the overall living standard by creating new employment opportunities through intensification of crop cultivation and agricultural diversification. Programs will be taken up to identify different government, semi-government, non-government development agencies and social organisations as the 'partner organisations' to channel micro-credit through them. To establish this institutional entity, necessary steps will be taken during the current Fifth Five-Year Plan (FFYP) period.

Government Support for Agricultural Production and Contingency Plan

It is necessary to take up government-support programs to encourage farmers to use modern technologies to increase crop production. Steps to be taken by the government in this respect are:

- Government support may be provided to farmers in various ways, such as reducing the prices of agricultural inputs, ensuring fair prices for agricultural products, exempting duties and taxes, sharing the cost of supplementary irrigation, lowering the rates of interest on agricultural credit, etc. A provision of block allocation for the Ministry of Agriculture will be kept in the Annual Development Programme (ADP) for this purpose. This money will only be used for government agricultural support programmes.
- The government will undertake contingency support programmes to compensate farmers for losses due to natural disasters. For this purpose, the revenue head of the Ministry of Agriculture will keep a provision for block allocation.
- The Ministry of Agriculture will have a contingency plan for implementing emergency agricultural rehabilitation programmes (ARP) to recover from crop losses due to any natural disaster at both the farmer and national levels.
- An early warning system will be strengthened to inform the farmers about their roles in adverse weather conditions based on specific information analysis. A plan is being prepared by the Department of Agricultural Extension (DAE) to provide an 'extension message' based on agro-

meteorology. An agro-meteorological centre will be established in the DAE for this purpose. The primary function of this centre will be to analyse agro-meteorological and agro-climatic data, forecast the sowing/ transplanting time and possible yields of crops to the farmers, and provide agro-meteorological advice.

Food-based Nutrition

As a follow-up to the World Declaration of the International Conference on Nutrition, 1992, the following agriculture-related programs are identified:

- Improving nutritional objectives, components and considerations in development policies and programmes.
- Improving food security down to the household level.
- Protecting consumers through improved food quality and food safety.

The government has already approved the National Food and Nutrition Policy and the National Plan of Action on Nutrition based on the unanimously adopted resolutions of the conference mentioned above. In this perspective, efforts are being made to increase the production and supply of nutritious crops and thus improve the status of food-based nutrition through implementing nutritional programs in the agriculture sector. These development activities will be continued.

Environmental Protection in Agriculture

Water logging and salinity appear to be severe problems in some parts of the country, including the coastal areas, which not only threaten agricultural activities in those areas but also can cause significant damage to the overall environment. The steps to be taken by the government in this respect are:

- Measures will be taken to resist waterlogging, and the farmers will be motivated to follow appropriate crop rotation and practice crop and fish culture by turns.
- Salt tolerant crop varieties will be developed and extended along with possible measures to resist salinity.
- Considering the environmental hazards associated with implementing crop production policy, necessary steps will be taken to protect the environment in accordance with the approved National Environment and Water Policies.
- Although foreign exchange earnings are largely attributed to shrimp culture in southern saline areas, saline water, together with shrimp disposals in shrimp enclosures and adjacent areas, have been appearing as a source of environmental pollution. In this respect, realistic steps will be taken in light of the already formulated Fisheries Policy.

Women in Agriculture

In Bangladesh's socio-economic context, women's involvement in agriculture is critical. It would be easier to control rural-urban migration by engaging women in agricultural activities to a greater extent. Considering women's involvement in agriculture, the following programs will be taken up to enhance their role under the scope of the National Agriculture Policy:

- In light of the New Agricultural Extension Policy (NAEP), a separate extension programme will be organised for women, as they also participate in the production of field crops.
- An appropriate research programme will be undertaken to identify constraints regarding women's participation in agricultural activities, and measures will be taken to remove those constraints.

Coordination among the Government, NGOs and Private Sector

It is impossible for the government, NGOs, or the private sector alone to solve the whole range of problems or fully explore the prospects of the agriculture sector. Since the problems are complex and widespread in agriculture on the one hand, and the available resource base is minimal on the other, the activities of government, private, farmers and non-government organisations will be coordinated in the following manner for the overall development of agriculture sector:

- Private sector agencies and NGOs will have the opportunity to participate in any programme related to the development of the agriculture sector. However, the government will reserve the right to postpone or ban any activity that is considered to be inconsistent with the National Agriculture Policy.
- Activities of the government, private organisations, and NGOs involved in agricultural development will be brought under a well-organized monitoring system. They will be coordinated from the national to the field level. One agriculture committee will be formed at each national, district, Thana, and union level to consider the issues related to overall agriculture and coordinate the activities of all concerned ministries and agencies involved. The National Agriculture Committee will be formed under the chairmanship of the Hon'ble Minister for Agriculture. Similarly, from the district to union levels, the respective chairman of the local government institutions will be responsible for holding the chair of the agriculture committees at each of the district, Thana and union levels. One farmer's organisation representative will be included as a member of the agriculture committees at each level.

Reliable Database

Successful development program implementation largely depends on the availability of reliable data and information in time. The government will take the following measures under the National Agriculture Policy to build up a reliable database:

- Adequate physical facilities will be created at the district-level DAE offices.
- District-level DAE offices will collect, compile, and preserve all information related to the crop sector through their official channels. For this purpose, adequate computer facilities and skilled human resources will be mobilised.
- Information on agriculture will be preserved and displayed publicly.
- Governments, private sector agencies, and NGOs involved in the agriculture sector will, in principle, agree to exchange information.
- The Bangladesh Bureau of Statistics will organise training programmes on appropriate data collection and preservation methods for the concerned agencies and provide advice in this regard.

Agricultural policy describes a set of laws relating to domestic agriculture and imports of foreign agricultural products. Policies taken between 1990-2020:

Policy	Major Goals and Policy Thrusts
Seed policy, 1993	Balanced development of public and private sector seed enterprises, simplification of seed necessary for research and commercial purposes, provision of training and technical supports in seed production, processing & storage monitor, control and regulate quality and quantity of seeds.
New Agricultural Extension Policy (NAEP), 1996	The goal of the NAEP is to: "Encourage the various partners and agencies within the National Agricultural Extension System (NAES) to provide efficient and effective services which complement and reinforce each other to increase the efficiency and productivity of agriculture in Bangladesh." In order to help implement the NAEP, the following committees have been formed (MoA, 1997): 1. Extension Policy Implementation Coordinating Committee (EPICC) 2. National Agricultural Technical Coordinating Committee (NATCC) 3. Agricultural Technical Committee (ATC) 4. Research Institute Co-ordination Committee (RICC) 5. District Agricultural Extension Planning Committee (DAEPC) 6. Upazila Agricultural Extension Coordinating Committee (UAECC) 7. DAE/ NGO Liaison Committee
Seed Act, 1997	Description of rules and regulations regarding the shifting functions of the National Seed Board, registration of seed dealers, seed certification, marking truthful labels, and modalities of seed assessment.

Policy	Major Goals and Policy Thrusts
National Fishery Policy, 1998	Development of fishery resources, growing fish production and self-employment, meeting demand for animal proteins, accelerating fish exports, and improving public health. Objectives: 1. Enhancement of the fisheries production. 2. Poverty alleviation through creating self-employment and improvement of socio-economic conditions of the fishers: 3. Fulfil the demand for animal protein, 4. Achieve economic growth through earning foreign currency by exporting fish and fisheries products; 5. Maintain ecological balance, conserve biodiversity, ensure public health, and provide recreational facilities. Related fisheries policies: 1. Establishment of hygienic fish landing centres 2. Transportation and marketing 3. Fish Processing -and Quality-Control 4. Fish Export 5. Educational 6. Policies related to fisheries 7. Fish Training Police 8. Fisheries Extension Program 9. Policy related to Fish research 10. Infrastructure facilities in the fisheries sector 11. Policy related to fisheries environment 12. Fisheries credit policy 13. 13. Policy related to fisheries cooperatives.
National Agriculture Policy (NAP), 1999	Food security, profitable and sustainable production, land productivity and income gains, smooth input supplies, fair output prices, improving credit, marketing, and agro-based industries, and protecting small farmers' interests. **Objectives:** The overall objective of the National Agriculture Policy is to make the nation self-sufficient in food by increasing the production of all crops, including cereals, and ensuring a dependable food security system for all.
Agricultural Extension Manual, 1999	Yearly crop planning, seasonal extension monitoring, participatory technology expansion and rural approval partnership, technical review, attitude and practice surveys.
DAE-Strategic Plan, (1999).-2002	Assessment of farmers' information needs, supervision, low or no-cost extension methods, and promotion of food and non-food crops.

Policy	Major Goals and Policy Thrusts
National Jute Policy, 2002	Keeping jute production at a desirable level, stabilising supply and prices of jute, developing commercially viable jute industries, accelerating privatisation, and developing multiple uses of jute and jute goods.
Plan of Action on NAP, 2003	Reviewing NAP and its implementation, setting out strategies and actions, and identifying institution and programme framework.
Actionable Policy Brief (APB), 2004	Prioritise immediate, medium-term, and long-term policy measures regarding seed, fertiliser, land, irrigation, mechanisation, marketing, agricultural research, and extension to increase labour and water productivity, investment in agriculture, and risk management.
National Agriculture Policy, 2013	The National Agriculture Policy's principal goal is to promote food and nutrition security for everybody, enhance rural livelihoods through improved crop production with higher productivity, and create employment opportunities through agricultural diversification. The specific goals of this policy are as follows: to provide a sustainable and profitable agricultural production system; Through research and teaching, to develop and spread superior agricultural varieties and sustainable production technologies; Increase production and income while also creating jobs by transferring applicable technologies and improving input management. Promote and sustain agricultural competitiveness through commercialisation: Encourage effective measures to build self-sufficient and sustainable agriculture that is climate change adaptive and sensitive to farmer needs. Ensure fair agricultural commodity prices and improved marketing; Encourage the development of high-quality agricultural products to fulfil the demands of international markets and expand export opportunities. Create opportunities for agricultural product processing and the establishment of agricultural-based companies; and Diversify agriculture to meet people's nutritional needs and encourage the cultivation of more nutritious crops.

Policy	Major Goals and Policy Thrusts
National Agriculture Policy, 2018	Main Goal: To achieve safe, profitable agriculture and sustainable food and nutrition security. Main Objective: Ensure food security and improve people's socioeconomic conditions by increasing crop productivity and production, farmer income, crop diversification, nutritious and safe food production, improving the marketing system, and profitable agriculture and efficient utilisation of natural resources. Specific Objectives: 1. Increase the availability of food, the right to food, and purchasing power by increasing crop productivity and production. 2. Modernize agricultural research, education, extension, input management and develop skilled workforce for sustainable technology innovation 3. Increase farmers' capability and income through institutional infrastructure development and efficient technology services 4. Adopt and implement food production plans to meet the needs of nutritious, safe and demand-driven foods; 5. Develop agricultural research for promoting the export of products through coordination with local and international partner organisations 6. Assist the farmers in increasing agricultural production, ensuring marketing facilities of agricultural commodities, and obtaining fair prices 7. Create a sustainable agricultural production system by increasing productivity through proper management of natural resources 8. Reduce the use of physical labour and introduce a cost-saving farming system through farm mechanisation. 9. Create new agricultural commercialisation and employment sectors through demand-driven and export-oriented agricultural development. 10. Ensure proper use of water resources through active participation in formulating strategies and their proper implementation through inter-ministerial inter-agency coordination.

Policy	Major Goals and Policy Thrusts
National Agricultural Mechanization Policy, 2020	Transition to efficient, profitable and commercial agriculture through agricultural mechanisation and ensuring sustainable food and nutrition security: To expedite the use of cost-effective and profitable agricultural machinery at the farmer level, increase productivity by increasing the skills of agricultural labour, and increase the use of mechanical, electrical, and renewable energy in the land to increase crop yield.

Key Challenges of Agricultural Policies on Agricultural Development

- Institutional weaknesses: A lack of reforms and weak stakeholder collaboration creates an unfavourable environment.
- Policy shortcomings: Poor or absent policies for public-private cooperation limit its potential contribution.
- Extension worker inefficiency: Extension staff may be inadequately trained or diverted from core duties, leading to weak service delivery. Additionally, the limited number of extension workers restricts their reach.
- Infrastructure limitations: A scarcity of extension facilities hinders the dissemination of technologies to farmers.
- Farmer organisation weaknesses: Inoperative or absent farmer groups and cooperatives impede the effective spread of information.
- Feedback and evaluation gaps: The absence of a platform for collecting feedback from extension workers across sectors and a lack of robust monitoring and evaluation systems hinder improvement.

Impact of Agricultural Policies on Agricultural Development

The agriculture industry is critical to Bangladesh's overall economic development. According to the Quarterly Labour Force Survey 2020, the agricultural industry (crops, animal farming, forests, and fishing) produces 14.74 percent of the country's GDP. It employs approximately 41 percent of the labour force (BBS, 2020). Agricultural policies strive to improve agricultural welfare by ensuring agricultural development, raising productivity, enhancing food safety and security, safeguarding and improving natural and biological resources, and building producer organisations. The major influence of agricultural policy on agricultural growth is establishing national self-sufficiency in food production, boosting farm family living standards, conserving agricultural resources, and minimising population pressure in the agricultural sector. The agriculture sector in Bangladesh is divided into four sub-sectors: crop and horticulture, animal farming, forest

and related services. Agriculture's sectoral contribution has been dropping over time, with the service sector capturing the lion's share in the early 1980s. Even though the population has doubled from 70 million to 140 million, agricultural productivity has increased sufficiently to sustain this population. With the rapid rise of the industrial sector, the service sector began to thrive and rose to first place in Bangladesh. Agriculture's proportion shrank as the expansion rate in other sectors outpaced that of agriculture. Dissatisfied with the policy's results, as evidenced by slow economic growth and a continuing difficulty with the balance of payments, and under ongoing donor pressure, Bangladesh launched the first adjustments in its trade and exchange rate policies in the early 1980s. The main trade and exchange rate policy liberalisation also included comprehensive liberalisation of agricultural trade and exchange rate policies and pricing reforms. By the mid-1990s, the distortion in agricultural production pricing on rice and wheat had been nearly eradicated, and total distortions were modest. In response to India's subsidised rice exports in 2001, Bangladesh substantially increased import tariffs on rice. However, domestic aid rates measured relative to international market prices show minor agricultural pricing distortions in Bangladesh in the current decade (Ahmed et al., 2007). Over the previous three and a half decades, Bangladesh's agriculture has undergone substantial structural changes and achieved significant success. Despite several obstacles and limits, a quiet agricultural revolution has occurred, allowing the country to attain national food security through food grain production. Agriculture advances in reaction to various causes, such as natural disasters, socio-political changes, population increase, urbanisation, new technology, opportunities in the rural non-farm sector, and commercialisation. In addition to significantly influencing price incentives in production and consumption, government macroeconomic, trade, and agricultural pricing policies will continue to be important determinants of agricultural growth. Regarding food security, Bangladesh has reaped significant gains from trade liberalisation; for example, private-sector imports have helped stabilise markets following significant production shortfalls. By maintaining near-border pricing for most agricultural commodities, domestic prices have resulted in overall efficiency benefits in the agriculture industry.

Rethinking Food Security: A Critique of Bangladesh's National Agricultural Policy

This section highlights the limitations of the National Agriculture Policy in making the nation self-sufficient in food by increasing the production of all crops in Bangladesh. Here is a breakdown of the critique:

- Declining Sectoral Contribution: While agricultural production sustains

a large population, its share of GDP is shrinking. This indicates a missed opportunity for broader economic development through agriculture. Bangladesh's agricultural sector holds immense potential for generating employment, income, and foreign exchange earnings. However, the policy's focus on achieving self-sufficiency in staple crops may neglect other high-value agricultural products that could contribute significantly to the country's economic growth and diversification.

- Policy Disconnect: Despite policy goals of improving farm incomes and resource conservation, the rapid rise of other sectors suggests these aims haven't been fully achieved. The policy framework might not effectively address the challenges faced by smallholder farmers, such as limited access to credit, markets, and technology. This could be hindering their ability to improve productivity and profitability and adopt sustainable practices.
- Limited Impact of Trade Liberalization: Trade liberalisation aimed to improve agricultural growth, but its effectiveness requires further exploration. While overall distortions are minimal, the example of rice imports 2001 suggests the policy might not be robust enough to handle external pressures. The policy's impact on agricultural trade needs to be critically evaluated, considering factors such as its influence on domestic production incentives, price stability, and farmers' competitiveness in the global market.
- Focus on Food Security: While crucial, the focus on self-sufficiency in staple crops may be overshadowing other aspects of agricultural development. The potential for diversification and higher farm incomes is not fully addressed. The policy could be strengthened by promoting cultivating high-value crops, fruits, vegetables, and livestock, enhancing dietary diversity, improving nutrition, and generating additional income for farmers. Fostering agro-processing industries could add value to agricultural products, create employment opportunities, and contribute to export earnings.
- Uncertain Role of Policy in Technological Advancement: This part highlights various drivers of agricultural progress, but the role of policy in fostering technological adoption and innovation remains unclear. The policy framework should actively encourage research and development in agricultural technologies, promote extension services to disseminate knowledge and best practices to farmers and create an enabling environment for private sector investment in agricultural innovation. This could significantly improve agricultural productivity, resource efficiency, and farm incomes.

Overall, this section suggests that while achieving food security, Bangladesh's agricultural policy is hindering the sector's full potential for economic development and diversification.

Conclusion and Recommendations

Various stakeholders, including farmers and rural residents, should be involved in developing and implementing agricultural policies and programs. Agricultural policy and program should also be open and transparent, and they should be set in a context in which agricultural development policy and program are national concerns based on a broad enough consensus to ensure continuity and freedom of expression of individual viewpoints on decisions. The government should encourage robust extension liaison services empowered and supported by adaptive research and mobile people equipped with the required media facilities and information. This will assist in solving the problem of target audience misinterpretation of policy/program objectives, tie their information to and from the research/government, and boost their involvement in the program since they are in closer contact with this audience, ensuring the program's success. Programs should also be monitored and assessed to determine their efficacy regarding a specific geographical impact. This is a very effective method for assessing the direct and indirect impact of multiple programs and projects interacting at the same time. Policymakers/planners should also discover and analyse alternative or different intervention programs in terms of their immediate and long-term impacts, as well as the implications for communities and society as a whole. Bangladesh should embrace the notion of policy/program consistency. This is the simplest method of streamlining, directing, and focusing agricultural development. This idea should be a significant concern in our future policies and programs. The government should create an environment enabling private sector participation in agricultural growth, particularly in processing, preservation, exporting, tourist, recreational, and environmental services. This will boost agricultural development and help us reach out to the rest of the world. From the above discussion, the following recommendations can be proposed for the role of agricultural policies in order to bring sustainable development in Bangladesh:

1. Diversification Strategy:
    - Promote high-value crops: Encourage the cultivation of fruits, vegetables, spices, and other high-value crops with strong domestic and export market potential. This can be achieved through subsidies, tax breaks, and technical assistance for farmers transitioning to these crops.
    - Support livestock and fisheries: Invest in infrastructure and training programs for improved livestock and fisheries management. This can

increase the population's productivity, income diversification, and nutritional intake.

- Value addition through processing: Support the development of agro-processing industries to add value to agricultural products, reduce post-harvest losses, and create employment opportunities.

2. Empowering Smallholder Farmers:
   - Improve access to credit and markets: Facilitate access to microfinance and other credit options for smallholder farmers to invest in improved technology and inputs. Additionally, invest in infrastructure and marketing channels to connect farmers directly with consumers and reduce exploitation by intermediaries.
   - Technology transfer and extension services: Strengthen agricultural extension services to train and educate farmers on best practices, resource conservation techniques, and adoption of new technologies.
3. Strengthening Trade Policy:
   - Targeted trade liberalisation: Evaluate the effectiveness of trade liberalisation policies on specific agricultural products. Implement safeguards to protect domestic producers from unfair competition while fostering healthy competition and export opportunities.
   - Focus on price stability and farmer competitiveness: Develop policies that ensure price stability for agricultural products while promoting Bangladeshi farmers' competitiveness in the global market.
4. Fostering Innovation:
   - Increase investment in agricultural research and development: Increase public and private investments in research on climate-resilient crops, improved crop varieties, and sustainable farming practices.
   - Public-private partnerships: Encourage collaboration between research institutions, universities, and private companies to develop and disseminate innovative agricultural technologies.
5. Integrating Environmental Sustainability:
   - Promote resource conservation practices: Adopt sustainable agricultural practices such as water conservation techniques, integrated pest management, and soil fertility management. These practices ensure long-term productivity and protect the environment.

Measures needed to take to implement the policies above

1. Extension services for all sorts of farmers: Extension services for better agricultural practices are available to all rural family members, male and female.
2. Efficient extension services: Cost-effective services delivered by well-trained, highly skilled agents are required to answer farmers' difficulties. Cooperation between extension providers and customers will improve cost-effectiveness.
3. Decentralization: Because agricultural conditions and farmer information demands vary by location, extension programs must be determined locally, particularly in remote locations.
4. Demand-led extension: Farmers' issues, needs, and requests will determine the extension agenda. Farmers and extension professionals will use participatory strategies to identify issues that require action.
5. Working with organisations of various kinds: Working with groups allows for more cost-effective use of limited extension resources, increased information sharing, and grassroots decision-making and involvement.
6. Strengthening the extension-research link: Extension and research organisations cannot function alone. Information must flow freely between them to provide a successful service to farmers.
7. Extension personnel training: All extension agents must be confident in their abilities to address farmers' problems, interact with various clients, and communicate with other agencies or persons. Training is required for this purpose.
8. Appropriate extension strategies: No single extension method suits all activities. Extension agents can use farm visits, mass media, training, demonstrations, group meetings, farmer field schools and many other methods.
9. Integrated extension support for farmers: Farmers' advice and information must be based on understanding integrated farming systems. If extension agencies with different areas of expertise are to give whole-farm guidance, they must work together.
10. Coordinated extension activities: Extension services supplied by various agencies must be coordinated at all levels to maximise resource utilisation. This can be accomplished by the entities involved in sharing information and expertise.
11. Integrated environmental support: The NAEP supports extension programs encouraging farmers to apply sustainable and environmentally friendly

agricultural practices. Efforts should be made to support and learn from farmers and the formal research system.

12. Ensure a profitable and sustainable agricultural production system and raise the purchasing power by increasing the farmers' real income.
13. Preserve and develop land productivity.
14. Reduce excessive dependence on any single crop to minimise the risk.
15. Increase production and supplies of more nutritious food crops, thereby ensuring food security and improving nutritional status.
16. Preserve existing bio-diversity of different crops.
17. Take up programmes for the introduction, utilisation and extension of bio-technology.
18. Take necessary steps to ensure environmental protection as well as 'environment-friendly sustainable agriculture' through increased use of organic manure and strengthening of the Integrated Pest Management (IPM) programme.
19. Produce and supply of agricultural commodities as required by the industrial sector;
20. Reduce imports of agricultural commodities and find newer opportunities for increasing exports as well;
21. Create opportunities for establishing agro-processing and agro-based industries;
22. Protect the interests of the small, marginal and tenant farmers;
23. Update the agricultural system in light of the Agreement on Agriculture to protect national interests through the WTO, SAFTA, and other international treaties and develop a contingency management system to combat natural disasters.

By implementing these recommendations, Bangladesh can achieve a more balanced and sustainable agricultural sector that contributes significantly to economic development, food security, and farmer livelihoods.

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