



A Study on the Impact of COVID-19 on Economy: Emphasizing on Agriculture

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ARTICLE INFO	ABSTRACT
Received date: Nov. 20, 2020 Accepted date: Dec.30, 2020	The present research was carried out during the period from May to September 2020 at Chapainawabganj district to analyze the potential impact of the COVID-19 pandemic on economy. The paper presents a brief summary of the global COVID-19 situation and impact of COVID-19 on livestock and dairy, poultry, fisheries and aquaculture, fruits and vegetable sector, ornamental plant sector and current food supply status in Bangladesh as well as in the world. The cause-effect relationship framework showed that the outbreak of COVID-19 slowed down the gross domestic product (GDP) along with major economic sectors and indicators in Bangladesh as well as in the World. Besides the economic shock, it is also facing an imbalance in the food supply in all of its channels. The short and long-run predicted scenario showed that, compared to the agriculture sector, the service and manufacturing sectors are affected more seriously in all South Asian countries. It was found that governments in the region including Bangladesh are trying their best to adopt and implement expansionary fiscal strategies to combat this situation. Though the government has taken some pragmatic and bold step to maintain sufficient food supply, protect the agriculture sector, and mitigate the possible losses.

Key words: Agriculture, COVID-19, Economy, Fisheries, Livestock, Poultry

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1. INTRODUCTION

The agriculture sector is the backbone of the world economy. It provides the basic ingredients to mankind and raw material for industrialization. Agriculture plays a vital role in the economy of developing countries, and provides the main source of food, income and employment to their Ural populations. According to FAO (2000), it has been established that the share of the agricultural population in the total populace is 67%, agriculture accounts for 39.4% of the

GDP and 43% of all exports consist of agricultural goods. COVID-19 is now a global pandemic. Every pandemic has affected the human activities and economic growth of the world. Currently we are facing Coronavirus Disease 2019 (COVID-19). COVID-19 is an infectious disease caused by Severe Acute Respiratory Syndrome Corona Virus -2 (SARS-CoV-2). The first confirmed case of COVID-19 was detected in Wuhan (Capital of China's Hubei province) epicenter of corona virus outbreak. Quickly after the first detection, the virus spread from China to 210

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countries and territories around the world and two international conveyances (Uddin et al., 2020). Due to novelty of virus strain, the disease is spreading among the people at alarming rate. WHO has declared COVID-19 outbreak as global pandemic on March 11, 2020. Currently, the world is going through a critical moment and the phenomenon is the newly emerging one of SARS viruses which was named '2019 Novel Coronavirus' by the World Health Organization (WHO, 2020a). The World Health Organization declared that this is not controllable from the first place, spreading day by day and has become a global pandemic (Cucinotta & Vanelli, 2020). At present because of the Corona crisis World Food Programme (WFP) predicted COVID-19 threats to food security under different circumstances and it has been expected that COVID-19 will cause pervasive poverty, poor healthcare infrastructure, lack of robust social safety nets, acute hunger, breaking the food supply chain, lowering food prices and most significantly recession in the economy (WFP, 2020). In a survey, BRAC reported that extreme poverty has rambled 60% than before and 14% of the people have no food at home (BRAC, 2020). The Bangladesh government and many volunteer groups are trying to raise funds and give food supply to the people but still, it is not enough. Though in some countries the spread of the pandemic has been slowing down and cases are decreasing, in others, COVID-19 is resurging or continuing to spread quickly. Both lives and livelihoods are at risk from this pandemic. Like many other countries, Bangladesh is also hit by a Coronavirus pandemic and now the whole country is locked down. We know that this shock is somewhat unusual as it affects significant elements of both food supply and demand: (a) Supply will be disrupted due to the disease's impact on people's lives and well-being, but also the containment efforts that restrict mobility and the higher costs of doing business due to restricted supply chains and a tightening of credit and (b) Demand will also fall due to higher uncertainty, increased precautionary behavior, containment efforts, and rising financial costs that reduce people's ability to spend. As a result, we know that border closures, quarantines, and market, supply chain and trade disruptions could restrict people's access to sufficient/diverse and nutritious sources of food, especially in countries hit hard by the virus or already affected by high levels of food insecurity. We are faced with a looming food crisis, unless measures are taken fast to protect the most vulnerable, keep global food supply chains alive. The virus has affected the lives of many people. It is estimated that COVID-19 will affect the global economy more than SARS. The Organization for Economic Co-operation and Development (OCED) has forecasted decrease in economic growth from 2.9% to 2.4% in 2020 and has warned that, economic growth may also reach nearly 1.5% if the pandemic is prolonged. ILO has stated that, "COVID-19 crises: The most severe crisis since the Second World War". Agriculture is one of the important sectors for world economy. FAO has estimated that more than 60% of the world population relies on agriculture for survival. According to ILO, out of total employer population in 2019,

26.85% of employers are in agricultural sector. In the scenario of ongoing global COVID-19 pandemic, it is important and of immense necessity to investigate the impact of COVID-19 on food and agriculture. Therefore, this paper was prepared to know all the possible impact of COVID-19 on food and agriculture in global context.

2. MATERIALS AND METHODS

In this study both the primary and secondary data are used. Secondary data were collected from different books, journals, thesis and through internet browsing. For collecting primary data there are five focus groups namely, livestock and dairy, poultry, fisheries and aquaculture, fruits and vegetable sector, and ornamental sector were formed to find out the impact of COVID-19 on agricultural economy of Bangladesh as well as of the world. Each focus group consists of 10 members including 5 skilled general farmers and 5 agricultural specialists. A list of topics and possible questions for the participants were developed before conducting the survey to ensure some structure and direction in the discussions. Each focus group discussion (FGD) session ran for about two hours and between three and five issues was covered. All the interviews and the FGDs were held in 'neutral' places, with no significance for the participants. The facilitators ensured that the meeting places were comfortable and that seating arrangements allowed participants to see and hear each other clearly by maintaining safety health measure suggested by the directorate of health, government of Bangladesh.

3. RESULTS AND DISCUSSION

3.1. Global COVID-19 Pandemic

Pneumonia of unknown origin first identified in China in December 2019 has spread globally and was declared a public health emergency of international importance in January 2020. WHO declared "COVID-19" as the name of this new disease in February 2020 following the recommendations previously established by the World Organization for Animal Health (OIE) and the Food and Agriculture Organization (FAO) of the United Nations. The COVID-19 pandemic is the greatest challenge since World War II not only for its health crisis but also people are losing jobs and income globally (UNDP, 2020; Xie & Chen, 2020). Primarily Coronavirus spread between people through close contact via small droplets produced by coughing (WHO, 2020b). Fever, cough, fatigue, and short breathing are defined as common symptoms of COVID-19. Some complications may also appear such as respiratory distress syndrome and pneumonia (WHO, 2020a). Considering the health aspect, COVID 19 is infectious and case-fatality rates of this virus are very high (Onder et al., 2020). Although people of all levels are facing critical health crises irrespective of gender and ethnicity, this pandemic is severely affecting women's health due to existing inequalities for women and girls (UNFPA, 2020). As a result of the pandemic, most of the countries adopted or imposed

quarantine, bans transport and restriction of citizens to travel to the most affected area (Salcedo et al., 2020). Some countries also imposed global restrictions that apply to all foreign citizens and trade. After or beside the health crisis of COVID-19, economic growth will be the highest suffering sector of all countries. The spread of the virus was believed to promote social distancing, leading to the closure of financial markets, corporate offices, companies, and events (Ozili & Arun, 2020). The crisis has now turned into an economic shake, affecting not only the production of goods and services but also consumption and investment (ILO, 2020). Even it has been expected that the global effect of COVID-19 may produce a recession in most parts of the world (Kumar et al., 2020). The United Nations Economic Commission for Latin America suggested that this pandemic could leave 14-22 million people in extreme poverty (Fariza, 2020). Though a risk also appeared like a slowdown investment of green technology because of economic fallout (Newburger, 2020).

3.2. Impact of COVID-19 on Global Economy

According to FAO there are several sources of effects over the global economy. Firstly, markets are more integrated and interlinked, with a Chinese economy that contributes 16 percent to the global gross domestic product. Thus, any shock that affects China now has far greater consequences for the world economy. Secondly, the supply shocks due to morbidity and mortality, but also the containment efforts that restrict mobility and higher costs of doing business due to restricted supply chains and a tightening of credit will affect economies leading to a reduction of economic growth or an economic recession.

In March, the Organization for Economic Co-operation and Development (OECD) cut its forecast for global economic growth in 2020 from 2.9 percent to 2.4 percent, which would be the lowest level since the financial crisis a decade ago, warning that a prolonged and more intensive corona virus epidemic could even halve this figure to a mere 1.5 percent. Thirdly, the demand will also fall due to higher uncertainty, increased precautionary behavior, containment efforts, and rising financial costs that reduce the ability to spend. Finally, there is a significant devaluation of the exchange rate with respect to the US dollar, which will also affect the import dependent countries.

Global food markets are not immune to these developments. However, they are likely to be less affected than other sectors that are more exposed to logistical disruptions and weakened demand, such as travel, manufacturing and energy markets (AMIS, 2020).

But given the complexity of the food value chains and the importance of trade and transportation, these could make them extremely vulnerable. This effect as shown in the report 2019 on the topic of the State of Food Security and Nutrition in the World will be most importantly in countries with high commodity-import dependence. Here, the negative effect is stronger, as a one percent increase in commodity-import dependence causes an average increase in undernourishment of 3.8 percent per year. When the

country is food-import dependent, there is an average increase in undernourishment of 8 percent per year. Furthermore, the demand shock will contribute to prolonging and worsening the effect. Agricultural development is very important to improve food security and nutrition. Its roles include: increasing the quantity and diversity of food; driving economic transformation; and providing the primary source of income for many of the world's poorest people. Numerous empirical studies across many countries over many years show that both agricultural development and economy-wide growth are needed to improve food security and nutrition, and that the former can reinforce the latter.

3.3. The Impact of COVID-19 on Agricultural Economy

Focus Group Discussion was conducted to find out the reason and problems in agricultural economy arises due to COVID-19 pandemic and the possible solution of those major problems. There are five focus groups namely; livestock and dairy, poultry, fisheries and aquaculture, fruits and vegetable sector, and ornamental sector were formed to find out the impact of COVID-19 on agricultural economy of Bangladesh as well as of the world. Each Focus Group consists of 10 members including 5 skilled general farmers and 5 agricultural specialists. The present scenario of the impact of COVID-19 on specific agricultural components is described in different focus groups in Table 1.

Agriculture is one of the important sectors for world economy and it is the biggest industry in USA. Agriculture is indispensable to food security and human development. Agriculture is important not only for the Supply of Food but also for the provision of raw materials for other industries. COVID-19 has affected different sectors of Agriculture. The World Trade Organization (WTO) Secretariat published a new information note last month examining the impact of the COVID-19 pandemic on world agriculture trade in food and agricultural products has been more resilient than trade in other products. Trade in agricultural products even increased in March and April 2020 (by 3.3 per cent and 0.6 per cent, respectively) compared to the same period in 2019. Trade in non-agricultural products dropped by 10.2 per cent in March and by 25.7 cent in April 2020 compared to the same time period in 2019. This situation is not same throughout the world which is described in different heads as follows

3.3.1. Livestock and Dairy

The livestock sector is a powerful engine for the development of agriculture and food systems. It drives major economic, social and environmental changes in food systems worldwide, and provides an entry point for understanding the issues around sustainable agricultural development as a whole. In china, COVID-19 has caused higher impactation livestock farming due to limited access to animal feed and shortage of labor. Travel ban in many countries has affected delivery of breeding stock of poultry. The International Poultry Council (IPC) has warned that there will be no breeding stock and hatching eggs if such

Table 1 The impacts of COVID-19 on agricultural economy (Based on FGD, n=10)

Number of the FG	Name of the Focus Group	Associated Problems	Possible Solutions
FG-1	Livestock and Dairy Sector	Lack of labor, lack of feed supply, low price of product, lack of capital	1. Mechanization should be applied in the farm through cooperative where necessary. 2. Self-service should be provided by the small farm owners. 3. Food staffs should be collected by the owners in case of small farm owners. 4. Government should provide subsidy to the farmers on each and every items. 5. Govt. should provide loan at low interest to the farm owners.
FG-2	Poultry Sector	Lack of labor, lack of feed supply, Customers do not want to buy egg and meat, low price of product, Lack of capital	1. Mechanization should be applied in the farm through cooperative where necessary. 2. Govt. should take all necessary precautions to flow poultry feed to the farmers and farm owners. 3. Awareness on necessity of eggs and meat should be increased through the customers. It should be announced that COVID-19 is not associated with poultry or poultry products. 4. Govt. should provide loan at low interest to the farm owners.
FG-3	Fisheries and Aquaculture Sector	Lack of labor, lack of feed supply, lack of capital	1. Mechanization should be applied in the farm through cooperative where necessary. 2. Govt. should take all necessary precautions to flow fish feed to the fish farmers and fish farm owners. 3. Govt. should provide loan at low interest to the farm owners
FG-4	Fruits and Vegetables Sector	Lack of labor, no storage facilities, low price of product, insufficient supply chain	1. Mechanization should be applied in the farm through cooperative where necessary. 2. Govt. should set up cold storage for storing fruits and vegetables. 3. Govt. should provide subsidy as well as loan at low interest to the farmers. 4. Suitable supply chain should be set up through building co-operative.
FG-5	Ornamental plants and floriculture Sector	Lack of labor, high price and lack of seed, fertilizer and other necessary materials, low market price of product (flower)	1. Mechanization should be applied in the farm through cooperative where necessary. 2. Govt. should take all necessary precautions to supply quality seed and planting materials to the farmers. 3. Govt. should provide loan at low interest to the flower growers.

travel restriction prolonged. The U.S. farmers have enjoyed strength in the economy but are now also paying the price of this pandemic when it comes to dairy products. This is also due to the lockdown of industries processing dairy products that are reducing their buying, which is making price going down, bringing huge costs for the farmers. For example, farmers in the USA were invited to dump their milk because of the lack of buyers. This same situation applies to developing countries where lack of infrastructure and longer distances from rural to urban areas make it even more

difficult for the majority of people to access stores.

3.3.2. The Impacts of COVID-19 on Poultry

With regard to the poultry industry, great attention has been given to restrict COVID-19. Given that COVID-19 are from the same genus and use the same Angiotensin-Converting Enzyme 2 (ACE2) host cell receptor, SARS-CoV does not infect or cause disease in poultry (Islam et al., 2020). Poultry production does not seem to be at risk due to the global spread of SARS-CoV (Jackwood, 2020). However, very

limited research has been performed with the COVID-19 virus in poultry. Jackwood (2020) and Swayne et al. (2004) have suggested that COVID-19 is not associated with poultry or poultry products. Furthermore, recent unpublished results from the Friedrich-Loeffler-Institut (Schlottau et al., 2020) have shown that pigs and chickens are not susceptible to intranasal infection by SARS-CoV-2. All swab samples, as well as organ samples and contact animals, remained negative for SARS-CoV-2 RNA, while fruit bats and ferrets infected by the same route simultaneously exhibited the contrary influences which stronger in ferrets than fruit bats (Schlottau et al., 2020)

3.3.3. The Impacts of COVID-19 on the Fisheries and Aquaculture

Fish is an important source of protein and energy and accounts for more than 20% of animal protein for 3 million people. Fishing activities have been reduced in different part of Africa, Asia and Europe due to sanitary measures (physical distancing), limited supply of inputs and labor shortage. Fish farmers are unable to sell their harvest as well as there is difficulty in aquaculture production due to lack of seed and feed. Agriculture produce are mostly perishable in nature, so farmer are compelled to store their unsold produce for longer period of time which leads to reduction in food quality as well as increase in cost of production. In the fisheries and aquaculture sector, there are many implications. The reduced demand in restaurants and hotels, coupled with many markets closed, have brought to a decrease of wholesale fresh fish prices, while there is restricted access to storage and alternative marketing facilities. Fishers also face difficulties to meet the new sanitary requirements and the social distancing measures. Because of these difficulties, a large part of the fleet has been forced to tie up. The COVID-19 pandemic and subsequent lockdowns are hampering the fisheries and aquaculture sector of the world. Millions of people depend on aquatic food and the aquatic foods are an integral part of their livelihood, food and nutrition security, and culture. According to FAO the impacts of COVID-19 on the fisheries and aquaculture food systems vary, and the situation is rapidly evolving. Fish and fish products that are highly dependent on international trade suffered quite early in the development of the pandemic from the restrictions and closures of global markets, whereas fresh fish and shellfish supply chains were severely impacted by the closure of the food service sectors (e.g. hotels, restaurants and catering facilities, including school and work canteens). The processing sector also faced closures due to reduced/lost consumer demand. This has had a significant impact, especially on women, who form the majority of the workforce in the post-harvest sector. The lockdowns implemented by some countries have resulted in logistical difficulties in seafood trade, particularly in relation to transportation and border restrictions. The salmon industry, in particular, suffered from increased air freight costs and cancellation of flights. The tuna industry has reported movement restrictions for professional seafarers, including

at sea fisheries observers, and marine personnel in ports, thereby preventing crew changes and repatriation of seafarers. Some shortages of seeds, feeds and related aquaculture items (e.g. vaccines) have also been reported, due to restrictions on transportation and travel of personnel, with particular impacts on the aquaculture industry. As a result of the drop in demand, and resulting price drops, capture fishery production in some countries has been brought to a halt or significantly reduced, which may positively influence wild fish stocks in the short term. In aquaculture, there is growing evidence that unsold produce will result in an increase of live fish stocks, and therefore higher costs for feeding as well as greater risk of fish mortalities. In some areas, an increase in retail sales has been reported due to the closure of the food service industry. Canned and other preserved seafood products with a longer shelf life have profited from panic buying at the beginning of the crisis. In some markets, suppliers have developed ways to provide direct supplies to consumers (e.g. box schemes) to replace lost fresh fish sales from established retailers. There are still many uncertainties ahead, particularly with regard to the duration and severity of the pandemic, but a prolonged market downturn is likely to introduce long-term transformations to the sector.

The Southeast Asian region has been a major contributor to the world's total fisheries production, and most of the region's fish and fishery products are traded in the international markets as well as in domestic/local markets. However, the rapid spread of the COVID-19 pandemic during the first quarter of 2020 not only in the region but also throughout the world, has impacted on the region's fish production from marine capture and aquaculture. Fishing operations at sea had encountered difficulties due to the national lock-down measures in many countries that prohibit fishers from going out to sea to fish. Meanwhile, fish farmers have also been limited to work outside of their homes to halt any further spread of the virus (SEAFDEC, 2020).

3.3.4. Fruits and Vegetable Sector

For many fruit and vegetables growing farmers, the time between March and May is particularly florid, but this year, due to the pandemic outbreak they are struggling to sell their products. The fruits and vegetable sector have been hit as well by the lockdown and measures undertaken by countries to fight corona virus with lack of marketing and buyers and falling in prices.

3.3.5. Ornamental Sector

Even worse situation is for the ornamental sector (flowers and ornamental plants, trees and bulbs) that is most affected by the social distancing and following cancellation of all gatherings, which has reduced buying flowers to the point that this produce is going from farm to waste, as it perishes too quickly to be preserved, creating great loss for the farmers. For the operators of the sector revenues have dropped to almost nothing. In Austria for example, mid-March until June is the most crucial time for the horticultural

business (50-70% of the annual turnover). Currently, essential supply chains are broken, due to restrictions: no selling through building centers, garden centre's, flower shops (lockdown) depending on the time of restrictions with some weeks or some months.

3.4. Disrupting the Supply Chain Activities

Most of the countries have taken measures such as home confinement, travel bans and business closure to control the rate of infection. Such travel restriction had affected every stage of food supply chain with major impact on food distribution. COVID-19 is disrupting some activities in agriculture and supply chains. Preliminary reports show that the non-availability of migrant labor is interrupting some harvesting activities, particularly in northwest India where wheat and pulses are being harvested. There are disruptions in supply chains because of transportation problems and other issues. Prices have declined for wheat, vegetables, and other crops, yet consumers are often paying more. COVID-19 has affected all the processes which connect farm production to final consumer. Moreover, it seems to strike the food production system and food value chain. The negative impact of pandemic on supply and demand for food might lead food security at risk (Poudel et al., 2020). Media reports show that the closure of hotels, restaurants, sweet shops, and tea shops during the lockdown is already depressing milk sales. Meanwhile, poultry farmers have been badly hit due to misinformation, particularly on social media, that chicken are the carriers of COVID-19. The supply of milk and dairy product has been hit hardest by COVID-19. Dairy farmers are compelled to dump milk and milk product after remarkable decrease in supply of milk and closure of milk processing company (WFO, 2020). Keeping supply chains functioning well is crucial to food security. It should be noted that 2 to million deaths in the Bengal famine of 1943 were due to food supply disruptions-not a lack of food availability.

3.5. COVID-19 can Create the Global Poverty Situation

To control the spread of COVID-19, at least 157 countries and territories in the world imposed varying levels of movement restrictions. In Asia, 12 countries implemented localized lockdowns, 10 countries implemented national lockdowns, and the rests implemented localized or suggested national recommendations, such as maintaining social distance. These COVID-19 induced lockdowns and movement restrictions can exacerbate the already worsening global poverty situation (Dunford et al., 2020). It is noted that COVID-19 will further exacerbate the poverty and abject hunger in the world in a number of ways. It is argued that the overburden on the health sector causes the reallocation of resources to the health sector to save lives, which may reduce resource allocation to the agriculture and industrial sectors, thereby hampering the food production and input supply chains (Readon, et al., 2020). More importantly, COVID-19 induced lockdowns and movement restrictions have already increased unemployment and

under-employment, which has severely reduced the purchasing power of consumers (Fsin, 2020). The International Labor Organization (ILO) estimates that the participation of the global working force in the first quarter of 2020 declined by 4.5% which is equivalent to 130 million full-time jobs (ILO, 2020). In a recent report, Asian Development Bank (ADB) projected that the COVID-19 induced global loss will range between \$6.1 to \$9.1 trillion compared to a no COVID-19 baseline, which is equivalent to 7.1% to 10.5% of the global GDP (Abiad, et al., 2020). The International Monetary Fund (IMF), warned that due to the COVID-19 induced lockdown and resource reallocation to the health sector to save lives, the global GDP could be reduced by 4.9% in 2020 compared to the previous year (IMF, 2020). The Economic Commission for Latin America and the Caribbean (ECLAC) and ILO projected that due to the COVID-19 pandemic, the economy of the Latin American and Caribbean region will shrink by 5.3% and the unemployment rate will increase from 3.5% to 11.5%, equivalent to more than 11.5 million new unemployed persons (ECLAC & ILO, 2020). Furthermore, the poverty rate in the region will increase by 4.4% and the extreme poverty rate will increase by 2.6% (ECLAC & ILO, 2020). Studies also warned about a possible severe food crisis, particularly in countries currently experiencing economic shocks, weather extremes, or conflicts (Fsin, 2020; WFP, 2020).

3.6. Farm Workers

According to World Farmers' Organization-WFO, in many countries farm workers come from neighbor or farer countries and with the social distancing and lockdown conditions is very difficult for people to move with the double effects of having less workers on the farm and less income in the farm workers' families. This period of time calls for seasonal workers to help farmers running their operations and due to the COVID-19 outbreak, farmers from different locations are expressing their worries and asking their governments to take action to make sure those workers from foreign Countries can move different locations to perform work on farms. In some Countries, Governments have made sure that workers from outside the States' borders could be allowed to get into the territory, in order to make sure that farms could run their work smoothly.

3.7. Health on the Farm

According to WFO, worldwide farmers are a relatively old population, as compared to the general worker population. In this special moment of COVID 19 pandemic outbreak, farmers throughout the world are in need to protect themselves, the farm labors and their produce with sanitation measures that are not always easy to implement. Sanitizers face masks and gloves are difficult to find almost everywhere, especially in rural areas and with the lockdown is becoming more and more difficult to find. Also, small towns and villages in the rural areas are usually quite distant from cities, which might be helpful in terms of reducing the risks of infection, but very negative both for rural and urban

areas if the virus spreads, or in case of developing countries with lack of appropriate infrastructures (roads, transport) or in case cities are isolated due to the outbreak as it is happening nowadays in many Countries. The lockdown has choked off almost all economic activity. In urban areas, leading to the widespread loss of jobs and incomes for informal workers and the poor. Estimates by the Centre of Monitoring India Economy show that unemployment shot up from 8.4% in mid-March to 23% in the first week of April. In urban areas, unemployment soared to 30.9% as of April 5, 2020.

3.8. Specific Measures have been taken by the Government of Bangladesh

Bangladesh Government has taken long term recovery plans to overcome COVID-19 Pandemic situation. With almost every country adopting aggressive non-therapeutic measures to control the spread of nCoV-2, Bangladesh in Southeastern Asia has followed the same trend; however, there is an ongoing debate as to whether measures have been adopted adequately and implemented efficiently (Anwar et al., 2020). The Government of Bangladesh has announced a number of stimulus packages monetary value more than BDT 1tn (USD 12.2bn) representing 3.7% of GDP for different sectors and beneficiaries. The packages are to be distributed by the banking sector under the guidance of Bangladesh Bank circulars to support the economy through these unprecedented challenging times.

3.8.1. Measures/packages

BDT 50bn (Approx. USD 595m) stimulus package for export-oriented industries: This includes loan assistance form payment of salaries for the month April May and June. Borrower will repay the loan within 2 years including a grace period of six months at 2% interest (KPMG, 2020).

3.8.2. Stimulus Packages of BDT 677.5bn (Approx. USD 8bn)

3.8.2.1. Package 1

Government formed BDT 300bn fund for banks to provide working capital loan facilities to the affected industries. These loans will carry interest at rate of 9%, half to be borne by borrower and half by Government as a subsidy. Bangladesh Bank has published a circular detailing about eligibility, application, management and other terms of the package on 12 April. On 23 April Bangladesh Bank has established Revolving Refinance Scheme of BDT 150bn to ensure financing by banks. Banks can borrow 50% of loan disbursed from Bangladesh Bank at 4% interest rate.

3.8.2.2. Package 2

Government formed BDT 200bn fund for banks to provide working capital loan facilities to Small (cottage industries) and medium enterprises. These loans will carry interest at rate of 9%, of which 4% to be borne by borrower and 5% by Government as a subsidy. Bangladesh Bank has published a circular detailing about eligibility, application, conditions,

reporting and other terms of the package on 13 April. On 26 April Bangladesh Bank has established Revolving Refinance Scheme of BDT 100bn to ensure financing by banks. Banks can borrow 50% of loan disbursed from Bangladesh Bank at 4% interest rate.

3.8.2.3. Package 3

Under Back-to-Back LC arrangement, the Export Development Fund was increased from USD 3.5bn to USD 5bn for facilitating further import of raw materials. Interest rate will be 2%. Bangladesh Bank has issued a circular on 7 April to implement the package.

3.8.2.4. Package 4

Central bank launched BDT 50bn pre-shipment credit refinance scheme. Bangladesh Bank has issued a circular detailing application method, payment method, reporting and other conditions of the package. It will be financed from Bangladesh Bank own source. Bangladesh Bank will charge interest 3% from banks and banks will charge 6% from customers.

3.8.3. Refinance Scheme BDT 50bn (approx. USD 595m) for Agriculture Sector

The scheme will be financed from Bangladesh Bank 's own source. The affected customers will be able to avail up to 20% extra of the existing loan facilities under the scheme. Bangladesh Bank will charge interest 1% from banks and banks will charge 4% from customers. The loan will be repayable within 18 months including 6 months grace period.

3.8.4. Refinance Scheme of BDT 30bn (approx. USD 357m) for Low Income Professionals, Farmers, Micro Businessmen

The scheme will be financed from Bangladesh Bank 's own sources. Loan limit to individual customer is BDT 75k to BDT 3m. Bangladesh Bank will charge 1% interest to banks. Banks will charge 3.5% interest to Micro Credit Financing Institutions (MCFIs) and MCFIs will charge 9% interest to customer. Customers will repay loan within 1 to 2 years including grace period.

3.9. Specific Measures have been taken by Different Countries to Overcome this Crisis

According to FAO in Canada, Farm Credit Canada's lending capacity has been increased by Canadian dollars (CAD) 5 billion and CAD 100 million have been earmarked for national, regional and local organizations to support food security across the country. Under the Canada Emergency Response Benefit, workers who are unable to work for medical reasons, and have limited or no paid leave benefit through their employers, can apply for up to 15 weeks of employment benefit for up to 55 per cent of their earnings, or CAD 573 a week. In China, the Peoples Bank of China introduced a 500 billion Chinese Yuan (RMB) expansion of re-lending and re-discounting facilities at low interest rates to support MSME's. The re-lending rate for rural areas,

agriculture, farmers and smaller businesses was lowered to 2.5 per cent as well. In Egypt, the moratorium on the tax law on agricultural land has been extended for two years. The Ministry of Social Solidarity is also planning to include another 100,000 families in existing social assistance programmes and to increase benefits to Egyptian pounds (EGP) 900 for women and leaders in rural areas. A one-time payment of EGP 500 is planned for registered informal workers. In El Salvador, US\$ 80 million will be allocated through the Emergency Fund to support the agricultural sector and ensure food security. A cash transfer of US\$ 300 has also been made to 1.5 million households working in the informal economy that do not have a financial safety net. In Fiji, an agricultural response package includes a new farm support package to support the production of short-term crops through the distribution of materials and seed. The COVID-19 Response Budget provides for a one-time relief payment of US\$ 150 for those working in the informal sector. In Germany, the Government has temporarily extended the “70-day rule” for seasonal farm workers, who may now work up to 115 days until the end of October 2020 without paying social security contributions. It has raised additional income limits for temporary work compensation and for farmers’ pensions. Paid sick leave has also been adjusted so that, where the Infection Protection Act applies, the amount received is equal to the worker’s net wage for the first six weeks, and is then equal to sick leave benefit. In Italy, under the Cura Italia stimulus, qualifying conditions for unemployment benefit for agricultural workers have been eased and a onetime payment of EUR 600 has been provided for vulnerable workers, including agricultural workers. Workers earning less than EUR 40,000 a year who have to be present in the workplace are entitled to a tax-exempt one-time benefit of EUR 100. In Namibia, the Economic Stimulus and Relief Package includes Namibian dollars (NAD) 200 million of guarantees for low-interest loans for farmers and agricultural businesses, including cashflow-constrained farmers and agricultural SMEs that have experienced a significant loss of revenue. A one-time Emergency Income Grant of NAD 750 will be provided to all formal and informal workers who have lost their jobs. In the Philippines, a Philippine peso (PHP) 27.1 billion fiscal package includes social protection for the most vulnerable workers and support for badly affected sectors, such as tourism and agriculture. Under the Emergency Subsidy Programme, 18 million low-income households working in the informal economy will be provided with PHP 5,000 to 8,000 a month for two months. The Overseas Workers Welfare Administration has also provided cash aid to overseas Filipino workers affected by travel bans.

The COVID-19 pandemic has had a tremendous impact on farmers in Bangladesh as well as in the World, particularly in scheduling sowing, planting, intercultural operations, harvesting, processing, procurement, transportation and marketing. The major findings of this research are as follows:

- Crops, Livestock, Poultry, Fisheries and Dairy have been affected seriously by this pandemic. Poultry

sector had also fallen into huge economic losses which is really unbearable.

- Flowers and vegetable sectors are also suffered from economic losses due to COVID 19. Farmers could not sell their produced flowers and vegetables due to COVID19 pandemic.
- Lack of laborer forces has been reported across the country, particularly in places where manual harvesting is predominant. The shortage of labor has been disrupting the production, processing and marketing of food, notably for labor-intensive crops.
- Farmers of Bangladesh are basically poor. They are not able to bring agriculture under mechanization and for this reason they are facing a labor shortage and their production has fallen into risk.
- The supply chain has been hit hardest by the COVID-19 pandemic, which causes food security of most vulnerable segment of population at risk.
- In response to the emergence of the COVID-19, Bangladesh Government, Administration and all forces namely Army, Police, Navy, Air Force are working together to overcome this situation.
- Bangladesh admittedly reduced international flights, imposed thermal scanner checking, and shut down schools and colleges with the other countries of the world.
- With the outbreak of COVID-19 declared a pandemic and an international public health emergency by the World Health Organization (WHO), the entire world is working to address it. Bangladesh also build emergency support fund to help its workers, employers, parents, marginal people, hosted refugees and farmers.

According to FAO, Countries should meet the immediate food needs of their vulnerable populations. Countries should boost their social protection programmes. Countries should adjust their cost to trade and tax policies. To avoid disruptions to the food supply chain and food production, FAO is also urging all countries to:

- Keep international trade open and take measures that protect their food supply chain (from obtaining inputs such as seeds to assuring smallholder farmers have access to markets to sell their produce).
- Focus on the needs of the most vulnerable, and scale up social protection programmes including cash transfers.
- Keep their domestic food supply value chains alive and functioning.
- Take all necessary precautions, seeds and planting materials must continue to flow to smallholders; animal feed to livestock breeders; and aquaculture inputs to fish farmers.

- Keep agricultural supply chains alive by any means whilst the safety and wellbeing of everyone working along the food chain is protected.

Therefore, the government should enforce the measures to control the pandemic without disturbing the food supply chain and considering the food security of their citizen. Government have to set up cold storage for storing fruits and vegetables and have to provide subsidy as well as loan at low interest to the farmers. Farmers should come forward to minimize the problems bringing agriculture under mechanization through setting up co-operative where and when necessary. Everybody should work together to solve this problems. With the collective efforts of Agricultural research and extension, we will be able to overcome the challenges of Bangladesh Agricultural economics arises due to COVID19 pandemic.

4. CONCLUSION

COVID-19 impacted Bangladesh Agricultural economy in many ways. Crop, Livestock, Fisheries, Dairy and Poultry have been affected by this pandemic. Flower and vegetables sectors also suffered from economic losses due to COVID-19. Food safety and security are the global concern at present situation. Food and agriculture are not outside the impact of COVID-19. The COVID-19 has a serious impact on the global trade and agricultural economy. The supply chain has been hit hardest by COVID-19, which causes food security of most vulnerable segment of population at risk. Farmers are not adapted to mechanized agriculture for this reason they are facing a labor shortage and their production has fallen into risk in terms of harvesting. Due to the shortage of buyer and unavailability of supply channels, products are being forced to sell at a low price and it will take years of time to overcome this shock as the prognosis of COVID-19 is still unknown to all. COVID-19 has really broken our dream of achieving the target. The policy planners of different countries should be formulated appropriate programs for short and long-run demands, along with economic and fiscal policies to sustain and revive the economic activity in the world.

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