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Impact of Climate Change on Agricultural Production in Bangladesh: A Review

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Abstract:
Bangladesh is a severely more vulnerable country to climate variation; its impact on agricultural production is extensive due to its different effects. The effect depends on its geographical location and environmental awareness. Impact of climate variation on agriculture is a global concern. Therefore in Bangladesh where lives and livelihood depend on agriculture, it's becoming a great threat for national food safekeeping. The review study endeavors to reveal the possible impact of climate change on agricultural production in Bangladesh covering the period from 1972 to 2019. Bangladesh has already begun to experience a negative impact. Temperature is progressively rising; river bank erosion, frequency of floods, magnitude of cyclone, storm surge, salinity intrusion, and the volatility of precipitation has enhanced compared to the past that led to the possibility of reducing agricultural production. For instance, climate alteration has become more concern for country's food safety. This is now the proper time to take and set up proper rules and guidelines through an inflexible outlook. The Bangladesh government tries to reduce the consequence of climate variation through the help of various national and international organizations. An inclusive measurement is ensured to enhance the competency of encountering climate change; otherwise it would be the cost of massive loss, particularly on agriculture in Bangladesh.

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Introduction

Climate change resulting from human activities has emerged as a global concern in the past 30 years. One particular worry is the adverse consequence for agriculture and food security in many parts of the world, particularly developing countries (Mertz et al. 2009). Crop farming is extremely vulnerable to climate change and it has been predicted that climate change would adversely impact on agriculture in the 21st century. Through higher temperature is induced more variable rainfall and extreme climate events such as floods, cyclones, droughts and rising sea levels (Molua, 2002; Isik & Devadoss, 2006; IPCC, 2007; WB, 2010). This susceptibility of agriculture to climate change has led to the scientific and policy communities questioning the capacity of farmers to adaptation (Reid et al., 2007; Mertz et al., 2009). The United Nations Framework Convention on Climate Change also identifies the danger to food production as a major concern (Reid et al. 2007).

Bangladesh is one of the more vulnerable country to climate change. The main reasons for its vulnerability is, (i) the location in the tropics, (ii) the dominance of floodplains, (iii) its low elevation from sea level and (iv) its high population density. However, it also has limited adaptive capacity owing to poor economic condition and limited technological competency (MOEF, 2005; DOE, 2007; Shahid & Behrawan, 2008; Pouliotte et al., 2009; Hossain & Deb, 2011). Extreme climate events like major floods, drought and cyclones occur almost every year, and sometimes more than once a year, affecting the agricultural sector adversely, particularly rice production (MOEF, 2005; Yamin et al., 2005). Rice is one of the major crops to feed the world's growing population (Shimono et al. 2010). As one of the most common staple food for humans, it feeds more people than any other crop (Maclean et al., 2002). In Bangladesh, rice production is very important because it is the staple diet of the Bangladeshi people and about half of the rural population is involved in agriculture. Agricultural production needs to increase to meet the future population demand. Any decline in agricultural production through climate variation would thus critically impair food security in the country. Therefore, quantifying the effects of climate change on agricultural farming and assessing the potential of rice farmer's adaptation to climate change is very necessary.

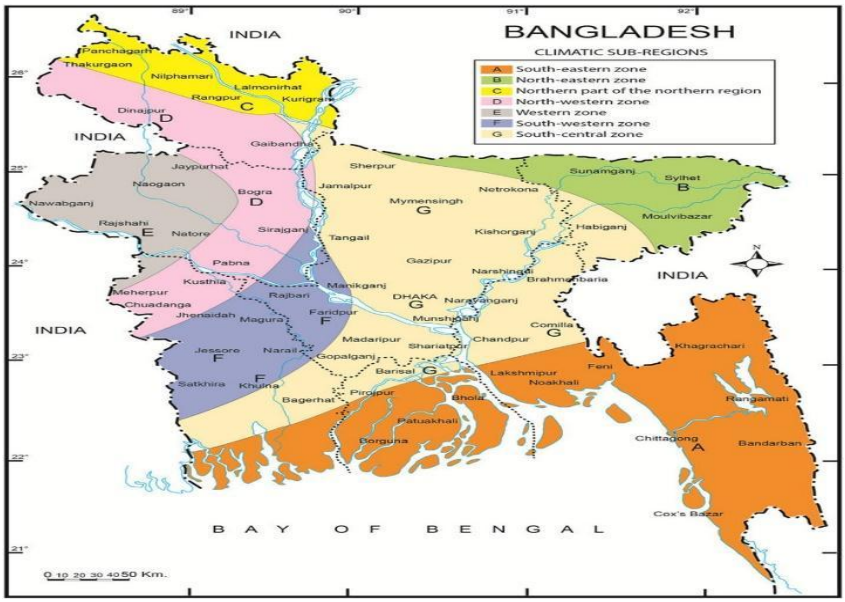

Figure 1: The seven climatic zones of Bangladesh.

Literature review

The Bangladesh economy is dominated by the agricultural sector. This includes cropping, livestock, forestry and fisheries. Agriculture accounts for almost 25% of gross domestic product (GDP) and almost 66% of the labor force depends on agriculture for employment (GOB, 2018). Crop production dominates Bangladesh agriculture. Crop agriculture accounts for 15% of GDP while livestock, forestry, and fisheries contribute to 2.95%, 1.87% and 5.51% respectively in the 2017-18 financial year (GOB, 2018). Rice is the dominant crop, and in terms of value adding, it accounts for more than 60% of total crop agriculture value (Asaduzzaman et al., 2010; Yu et al., 2010). Overall, food grain yielding plays a vital role in the agricultural economy. Almost 80% of the total cropped area is planted with rice which accounts for over 90% of total cereal production (GOB, 2009; Asaduzzaman et al., 2010). Given the percentage of the total population dependent on agriculture for their livelihoods and the contribution of agriculture to the GDP, it can be said that crop agricultural development is a key strategy in the economic development of Bangladesh in the foreseeable future.

This review study is therefore designed to identify the climatic factors which are likely to affect agricultural production, evaluate the nature and patterns of effects of climate change on agricultural production and undertake the in-depth study of climate variation related issues in Bangladesh. The study uses secondary data and all the data has been collected from national and international sources like various libraries, online journals, BBS, WDI, ADB, World Bank, FAO, BMD, and Agricultural Ministry of Bangladesh. Climate change and food security related different books, research papers and journals which pursue empirical investigation on impact of climate change on agricultural production in Bangladesh by mainly using quantitative research methods have also been gone through. The study covers the period of 1972-2019. **Ahmed et al. (2019)** investigated an important research issues of climate change and vulnerability of two coastal villages in Bangladesh that are environmentally vulnerable. Natural disaster, low infrastructure and socio-economic condition, sea level rising, salinity intrusion and increasing temperature are usual characteristics of these coastal villages. The study revealed that climate change and vulnerability produced an important negative effect on public health, reducing agricultural yields, salinity intrusion, rising sea level and increasing temperature. The irregular rainfall has adverse effect on soil and waterlogging, resulting in damaged livelihood, destroying the environment and ecological balance. The finding just shows the negative impact of climate variation on agriculture and environment. **Hossain et al. (2018)** conducted a study to show the economic impact of climate change on yield farming in Bangladesh. The Ricardian model reveals the relationship between net crop income and long term climate variables. The study shows that the enhancing rainfall and moderate temperature is increasing to the net crop income. Which implies positive impact of climate change on crop production in Bangladesh. The supply of actual income effect indicates that every climatic zone would not be affected equally by future climatic change. The finding of the research just shows the positive economic impact of climate change but it is not a negative impact identified. **Rahman et al. (2018)** investigated a review article to exhibit the impact of climate variation on temperature, frequency of flood, salinity intrusion, and storm surge and river bank erosion on crop production in Bangladesh. The study shows that the climate variation plays a negative role in crop production and environmental balance. Bangladesh has already been suffering from those issues such as increasing temperature, rising sea level, magnitude of cyclone, devastating flood, river bank erosion, saline intrusion which have reduced crop production.

Greenhouse gas backs up the increasing factor for global warming, which makes Bangladesh as a vulnerable country in the globe. The researcher gives some suggestions for policy makers that would help reduce adverse impact on human and natural environment. **FAO, UN. (2018)** conducted an annual report to reveal the implications of climate variation on agricultural small farming and livelihood, poverty reduction, livestock and adaptation. The report demonstrates that the near and North African small scale agricultural farm is affected by implication of climate variation. The study shows that the climate variation plays an important negative role on economic growth, reducing productivity, livestock and forestry, fisheries, global warming, and food safety. The risk of animal food security, infection and disease has decreased animal productivity. **Hossion et al. (2018)** conducted a review study to express the impact of climate variation on agricultural productivity, food safekeeping, livestock, fisheries and coastal livelihood, which are affected by global warming and adverse impact of climate variation. The study exhibits that the implication of global climate effects on vulnerable agricultural productivity, creates food insecurity, destroying coastal livelihood, food safekeeping, fisheries and livestock. Most of the coastal individuals are poor but they contribute to play a vital role ensuring food safekeeping by women. Present adaptation policies are in vain to control food security and vulnerable people. The researchers found that climate change plays an important negative role on agricultural production and food safekeeping. **Maniruzzaman et al. (2018)** explained a study to reveal the impact of utmost temperature on agricultural production, increasing global warming and rice yields enhancing various seasons of Bangladesh. The paper shows that moderate temperature performs a significant negative role in decreasing rice yields. On the other hand, extreme temperature has an important positive correlation effect on rice production, and cold temperature negatively correlated with agricultural productivity. Warm and cold night would have adverse impact on rice productivity of Bangladesh. The research's outcome just demonstrates the negative and positive impact of climate variation on agricultural productivity in three different seasons without being numerical. **Kaur (2017)** conducted a study to show the impact of climate alteration on agriculture and food safe keeping in India. The results reveal that most of the agricultural crops are adversely affected by climatic variation. Wheat and cotton production is not meaningfully exaggerated by weather, simultaneously rice and sugarcane are the most positive effect by the climate alteration. The negative correlation are shown between productivity and precipitation of wheat. The research shows that climate variation has both negative and positive roles in the context of global warming in agricultural productivity and analytical impact of climate variation. **Moniruzzaman (2017)** conducted an important PhD thesis to show the climate variation and repossession from weather hazards in micro-econometric analysis. The thesis reveals the emphasis on resources and environmental economics which could individually recover natural disasters and how it adapted climate variation. The major findings are: (a) climate variation and disaster have an adverse effect on poverty and adaptation of global evidence, (b) crops production would have more sensitive variation of temperature than change in precipitation of Bangladesh, (c) crops varieties are weather sensitive from different areas with their climatic condition and(d) adverse effect of cyclone on income and consumptions is more thoughtful for poor people than higher income level household, non-affected areas are better than the higher income level people resilience in their economic growth. The study shows that both disaster and climate variation play an important negative role on economic growth. **Barrueto (2017)** has endeavored to exhibit the impact of climate variations on precipitation, temperature and the market system of agriculture in Nepal. The study expresses that climate variation plays an important negative role for developing the market system, level of precipitation and

temperature revolution depending on climatic zones. The research's outcome just shows that the climate variation reveals different accounts from market function, intervention of climate related bazar system, certain account for each diverse market function but it is not quantified. **Richard et al. (2017)** have conducted a review article to reveal the consequence of global climate variation on agricultural yielding, livestock and economic influence of the U.S.A and Latin America. The study exhibits that the human activities are liable for global climate variation, which leads to main obstruction to adaptation, food production and expenditure, decreasing temperature resulting in economic loss. The research's outcome reviews that the effects of economic calculation is a bit positive on U.S. agriculture and predicted that the next century would see decreased food production, economic losses, imposition of huge cost, enhancing temperature, carbon dioxide doubling and need to assess the magnitude of global warming for livelihood policy as it is highlighted. **Kabir et al. (2016)** have focused on their study to show the influence of climate variation on coastal areas of Bangladesh, experienced cyclones Sidr and Aila. Implication of climate variation has adversely influenced on global weather and so, heat weave, cyclone, drought, flood, heavy rainfall and natural disaster are going to enhance seriously. Subsequently the lifestyle of affected people would change their livelihood pattern. The study reveals that climate change plays an important negative role on socio economic condition of individuals and the health status of people are more vulnerable to coastal belt of the country. **Ochieng et al. (2016)** focused in his study to show the effect of climate variability on agricultural production, food security and revenues since all crops, specially tea and maize in the small case of Kenia. The study exhibits that the climate variability has an important positive role to tea and negative impact on crop and maize revenues in economic growth. The research's finding just shows that the tea production depends on stable temperature and regular rainfall. In additional rainfall and temperature would be negatively implicated on production. Temperature is more significant for global warming than rainfall but the result is not quantified. **Parganiha (2016)** investigated a PhD thesis to reveal the impact of climate change on agricultural activities and farm perception. The study exhibits that climate condition change in rainy season, winter and summer season. The traditional crops varieties have reduced agricultural production and investment. As a result climate variation on winter productivity is being reduced, subsequently seasonal rain pattern would be fluctuated for adverse impact on agriculture. The study shows that farmers' perception and climate variation both play an important positive and negative role in economic development. **Nahar (2016)** has found a study to express the effect of climate variation on agricultural production, sea level rising, food safekeeping, non-rice agricultural yield and consumption. The study reveals that the impact of climate variation represent an important negative role on economic growth, reducing of agricultural productivity, household earns and expenses. The agriculture and non-agriculture productivity is enhancing in rice price, non-rice cultivable land, and crop's land are reducing consistently in Bangladesh. **FAO, UN. (2016)** have investigated a study endeavor to show that the implications of climate change on agricultural yielding, food safe keeping, poverty reducing, global warming and sustainable development. The study shows that the climate variation plays an important negative role on economic growth, sustainable development, poverty reduction, and productivity of yielding, livestock, forestry, and fisheries, global warming and food safe keeping. It is not possible to mitigate climate variation without adaptation free from hunger, poverty, malnutrition and greenhouse gases release (GHG).The UN research's outcome just exhibits the negative impact of climate variation on living earth without being numerical result. **Alagidede et al. (2015)** conducted a study to show the impact of climate change on economic growth, temperature and precipitation. Economic growth noteworthy would

reduce by global temperature. Subsequently actual GDP and temperature relationship are really nonlinear while internal correlation is actually difficult for economic growth and development. The study shows that climate change has an important negative role for reducing economic growth. The relationship between climate variation and economic growth explores in the long-run and short-run of Sub-Saharan Africa. The researchers finding just shows the negative impact of climate variation on economic growth but it is not quantified. **Akram and Hamid (2015)** found a study to show the effect of climate impact on economic growth, negative relationship with GDP and agricultural productivity, industrialization, underprivileged human development index, and emission of greenhouse gas as well as services sectors. The study asserts that climate variation has a negative and substantial impact on GDP growth, and is more severe on the agricultural sector, industrializing as compared to producing and services. The research's finding just shows the negative impact of climate change but it is not quantified. **Paul et al. (2015)** have illustrated a report endeavor to exhibit the impact of climate variation on agricultural farm and food security, food exporting and food importing countries, Greenhouse gas outflow and adaptation. The study explains that climate variation leads to an important negative effect on economic growth, reducing productivity of agricultural crops, global food safety and challenge, forestry, livestock fisheries and global warming. The research's result demonstrates the negative impact of climate change on agricultural sectors and human activity. **Gertz (2015)** made an important PhD study endeavor to illustrate that the expenditure of climate variation programs on developing countries, economic implication of flood, the expense of decreasing carbon outflow and larger reducing in GDP. The study reveals that structural climate variation has an important positive and negative role on GDP in the context of developing countries, economic growth, constructions and intensity of carbon outflows. The researcher's finding just shows the negative impact of climate variation but it is not quantified. **Amin et al. (2015)** have conducted an important study to exhibit the effect of climate variation on crops production, food security and major agricultural yield. The study shows that climate variation has a positive contribution of major food yield. Most of the food production are affected by maximum temperature but not including Ause rice. Minimum temperature has unimportant influence on Amon rice but promotes other crops. Aus rice is benefited by rainfall but then again Amon rice is affected significantly. The role of humidity positively contributed to Amon and Aus rice, whereas Aus rice is negatively affected. Only Boro rice is significantly promoted by sunshine. Most of the food crops are adversely affected by higher temperature and only Amon rice is severely affected by the rainfall. **Banerjee et al. (2015)** have investigated a study to explore the impact of climate change on agricultural productivity, rising sea level, reducing cultivable land and adversely affected on GDP and food safekeeping. The study exposed that implications of climate variation perform a significant negative role in GDP growth, reducing agricultural production, enhancing food imports, decreasing food security and national economic growth. The research's outcome just demonstrates the negative impact of climate variation without being quantified the consequence. **Zahi and Zhuang (2015)** have investigated a study to show the impact of climate variation on agricultural yielding and the economic implication on Southeast Asian states. The study reveals that agricultural aggregate effect of climate variation on global economy, agricultural destruction and productivity has a significant negative role on economic growth and terms of trade. The researcher's outcome just shows the more negative effect of climate variation on some countries than other Asian countries but it is not quantified. **Gadedjisso (2014)** conducted a master's thesis to show the influence of climate variation on small farmers 'crop yield in 35 districts in Togo. The study exhibits that climate has a nonlinear consequence on net returns

from crop yield. The rainy season temperature implication on farmer's revenue is negative and one for rainfall plays an important positive role. Togo has developed their farm's adaptive capacity in various sectors. The researcher's finding just shows the negative impact of climate variation, simultaneously expresses the positive impact of climatic variation but is not quantified. **Kumar et al. (2014)** have investigated an important review study to show the influence of climate variation on agricultural yield in India, especially water, biodiversity and usual resources harmfully affecting human lives and biosphere. The study attempts to explore that India is experiencing high temperature changing summer and winter. The average temperature would increase and predicted carbon dioxide is going to be doubled within a very short period. These would have drastic implications on agricultural production. The research's findings just reveals that climate variation plays an important negative role which would reduce crops productivity but it is not quantified. **Sikder and Xiaoying (2014)** conducted a study effort to reveal the implication of climate change on major crops, national food safekeeping, salinity intrusion, high temperature, precipitation, erratic rainfall and livelihood. Bangladesh economy depends on vulnerable agriculture which is a substantial threat for national economy. The study tries to show that the effect of climate change has a significant negative role on major crops production, poverty induce, enhancing agricultural production, salinity accepting, flood tolerance, drought, erratic rainfall and shorter maturities of rice varieties. There are urgent needs for achieving national food security which leads to mitigate challenge for Bangladesh.

Issahaku (2014) has conducted a Ph.D. thesis to reveal the impact of climate change on major crops yield, micro-macro analysis of agricultural productivity and poverty in Ghana. The study attempts to show that climate change has an important negative role which could adversely affect on agricultural productivity, net revenue of major crops and increasing poverty. The influence of climate variation on maize and rice is negative and reduced maize revenues, on the other hand, sorghum production increased, in case of other crops revenues are negative. **Iqbal and Siddique (2014)** have conducted a discussion paper to express the strong implication national and international perspective of climate variation on agricultural efficiency, food safekeeping, and poverty. The study exhibits that climate variation plays an important negative role on agricultural productivity, compared with unobserved and observed variables, food security and poverty reduction. There are no robust estimate which found the impact of climatic variables of the paper that could be adverse impact on living and non-living beings. **Brammer (2014)** made an important study to show that the 21st century Bangladesh would be affected by the sea level rising, global temperature and many people being displaced from their homeland, is a serious misconception for Bangladesh. Depending on inappropriate information enhances worse situations for coastal regions of the country. Applicable adoption could reduce physical geographic impact, significantly present prediction about the sea level rising and global temperature. The researcher's outcome just exhibits little by little increasing global warming and prevailing environmental hazard, salinity intrusion in the groundwater coastal belt of the south west of Bangladesh. **Minar et al. (2013)** have investigated an empirical study to show the implication of climate variation on vulnerabilities, adaptive capacity, natural environmental balance, salinity intrusion, flood and cyclone, inundation and the coastal deltaic zones. The study tries to express the implication of climate variation on coastal deltaic zones of Bangladesh which are more vulnerable country of the world. Bangladesh had already explored very much pressure and growing stress which is facing severe climatic effects as well as enhancing cyclones, inundation, frequency of flood, increasing water level, saline water intrusion, destroying

ecological balance and reducing coastal environment. **Amir and Ahmed (2013)** have conducted a study to express the effect of climate variation on agriculture productivity, high temperature, heavy precipitation, greenhouse gas emission, adaptive capability measure, global warming, salinity intrusion, crops variety and food safekeeping at the study area patuakhali of Bangladesh. The study endeavors to reveal that the implication of climate variation has an important negative role which leads to reducing agricultural production and decreasing food safekeeping. The coastal belt crops varieties production is increased. The research's finding just shows the positive and negative impact of climate variation but it is not enumerated. **Fazal et al. (2013)** have conducted a review study endeavor to exhibit that the economic impact of climate change on the agricultural sector which is dependent on weather, climate, and water supply, harmfully affected by climate related disaster and carbon dioxide emission. The review studies emphasis on the understanding and determining the consequence of climate variation on the agro based economy, drought and floods are leading to vulnerability for agriculture as well as adversely impact on socio- economic phenomena. Present development and adaptation cope with the negative properties of climate variation. The paper tries to show how the climate variation and agriculture are correlated with each other. **Maponya and Mpandeli (2012)** conducted an empirical study to show the impact and adaptation of climate change on agricultural production at Limpopo province in South Africa. The study exhibits that the farmer received climate change information from the extension service. Food security and unemployment are the special determinants of agricultural yield which having important negative role on agricultural sector in South Africa. The outcome of this study is potentially defenseless to the agricultural zone considering the pressures that climate variability poses through the climatic sensitive sectors. The research's outcome is fully descriptive but is not quantified. **Stefanos et al. (2012)** have conducted an important study to show the impact of climate change on productivity of Greek agriculture, precipitation, extreme temperature, carbon dioxide, adaptation capacity of farmer's productivity and economic cost. The study attempts to exhibit that climate change has a direct impact on agricultural crops yield, frequency and severity of rainfall and utmost meteorological conditions and enhancing carbon dioxide. During the last three decades, financial expenditure of climate variation in agricultural productivity increased. The researcher's findings just reveal that the different techniques should be taken for mitigating the negative consequence of climate variation on the agricultural sector. **Sarker (2012)** has estimated the study to reveal the impact of climate change on rice yield and farmers' adaptation in Bangladesh. The study tries to exhibit that Bangladesh is more vulnerable to climate change, due to negligible performance to climatic condition. Rice is the staple food and, its productivity is increasing gradually. The result implies that different level extreme temperature is enhancing risk for Aus and Amon rice, even though it would be risk declining for Boro rice production. The study shows that the precipitation risk is enhancing for Amon rice while reducing for Boro and Aus rice, consequently disaggregated data could not be shown in what way different farms are affected by the effect of climate variation. The researcher's findings just show that climate change plays an important negative role which leads to adverse impact on economic growth and development. **Mahmoud (2012)** has illustrated a study to reveal the impact of climate variation on environmental resources, public health, enhancing temperature, salinity intrusion, ecological conservation, agricultural production and biodiversity. The study shows that climate variation plays an important negative performance on increasing droughts, reduced economic development and adverse effect on public health. Destroying biodiversity and natural disasters are extinguishing environmental assets, emitting greenhouse gases, food safekeeping, rising sea level and

salinity intrusion which are making Bangladesh more vulnerable. **Hans (2011)** has presented an international conference paper named climate change and social issues attempting to show the impact of climate variation on agricultural productivity, environmental crisis, global warming and carbon dioxide. The paper expresses that climate variation plays an important negative role which reduces crops yield, increasing global temperature, adverse effects on agricultural production, and interaction climatic elements including glacier melting and environmental issues. The researcher's conclusion just expresses the negative impact of climate variation but it is not quantified. **Singh (2010)** produced an important study to show the socio-economic impact of climate alteration on agricultural land use in India. The study expresses that climate change plays an important negative role on economic growth which adversely affects agricultural crops yield, forest and fisheries, water distribution, livelihood and biodiversity. **Sikder (2010)** has presented a conference paper attempting to explore the impact of climate change on agricultural production, environmental balance, erratic rainfall and temperature, salinity intrusion, increasing flood and drought and food safekeeping. The research's findings just express that the negative impact of climate change on ecological scenarios are vulnerable which is alarming for rising sea level. The use of more fertilizer is increasing irrigation leading to loss of fertility, biodiversity loss, extinction of indigenous varieties, scarcity of ground water and damage to sustainability of production. **Ayinde et al. (2010)** have investigated an important study endeavor to explore the empirical analysis of climate variation on agricultural production, changing climatic constraint, and relationship between climatic parameter and trend of agricultural productivity in Nigeria. The study exhibits that the temperature remains unchanged and the Nigerian climate change does not adversely affect agricultural production. The granger test shows that the climate variations have positive impact on agricultural productivity in related fields. Enhancing and reducing precipitation patterns are distressing the prevailing production which leads to up-down productivity. **IFPRI (2009)** has investigated a study to expose the impact of climate variation on agriculture farm and food security, livelihood, human health, adaptation and greenhouse gas release. The report expressed that the climate alteration had an important negative impact on economic growth, increasing poverty, and reducing productivity of irrigated yielding, global food safety, forestry, and fisheries, global warming . The IFPRI research's outcome demonstrates the negative impact of climate change on agricultural sectors without being numerical. **Pender (2008)** has conducted an important study attempting to exhibit the economic impact of climate change on food production, global warming, precipitation and temperature, biological diversity, food safekeeping, sea level rising and salinity intrusion of Bangladesh. The study expresses that climate variation plays an important negative role which could affect global temperature, reducing agricultural production, resulting in greenhouse gas release. Flood and glacier melt would be more intensive. It is also observed that the environmental, economic and biological diversity would be threatened by climatic variation. **Sarwar (2005)** has investigated a study to exhibit the impact of sea level rise on the coastal zone of Bangladesh. The study shows that the sea level rise has an important negative role on coastal areas and flood plain zone of Bangladesh which has adverse influence on coastal communities and biodiversity, food security and natural protection. It would be the loss of important ecosystem by one meter sea level rising, resulting catastrophic attack on moderate adaptation policy. The researcher's finding just shows the negative impact of sea level rise on the coastal zone of Bangladesh but it is not quantified. **Parry et al. (2004)** have conducted an important study to show the impact of climate variation on global crops production, socioeconomic situation and chance of hunger. The study demonstrates that impact of climate variation has an important negative role on

developing countries more than developed countries in economic growth. The regional and international crops production reduced food yield co-ordination. The researcher's outcome just illustrates the negative impact of climate variation but it is not calculated. **Tobey et al. (1992)** conducted a study to exhibit the economic impact of global climate variation on agricultural production. The study revealed that the outcome of climate change has a serious negative impact on the world crops yield and productivity damages. The most important crops producing zones of the world are affected by global warming but would not be a severe attack on the agricultural market. **Bera and Kelley (1990)** have found a study to reveal the impact of other economic volatility, spread rate of high yielding crops, diversity and adaptability. The study shows that HYRV performs a significant positive role on enhancing rice production and flood could damage high yielding rice production. The declining rate of jute price index and price of rural rice varieties plays a vital role on economic growth and development.

Conclusion

In spite of having very little contribution to produce greenhouse gas release now Bangladesh is measured as the most vulnerable country in the world owing to global warming .The geographical location of this country induces a susceptible natural effect such as cyclone, global warming, floods, storm surge and sea level rise. Moreover high density inhabitants and low elevation plane deltaic topography have harmful possibility of additional loss in reply to any types of disasters. This review paper endeavors to combine different studies outcomes and predictions, which has formed various times on behalf of Bangladesh in consequence of disaster or universal temperature rising on agricultural production. The comprehensive literature review sums up that Bangladesh has fallen in danger of agricultural production due to climate variation and resulting in reduced agricultural yields. Bangladesh is highly susceptible to going down water in response to sea level rise which would lead to unlimited damage to agriculture, livestock rearing, aqua culture, and all the effects would reduce the aggregate food production significantly. Consequently it might collapse the whole human-environment. Even though, Bangladesh government has co-operated with multiple organizations and other countries endeavoring to diminish the impacts of global warming along with the government, it is gradually determined to look for the best adaptive policy to empower the distressed people. The inhabitants of Bangladesh are not so much conscious of subsequent environmental rules and regulations; so, awareness building programs must be ensured through radio or Television and newspaper, introducing climate concerns in school and college level books. This is now the proper time to ensure and implement proper rules and regulations through a positive attitude.

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