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Short Communication

Climate Change and Food Security: A Biggest Challenge for World's Economies

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Feeding to present and growing population is one of the most critical challenge for global policy makers and international development organizations at world-wide [1-3]. There is a sufficient food to meet global food supply requirement of the world's population. Despite that 870 million people do not have secure resources to feed their self (https://www.usda.gov/topics/food-and-nutrition/food-security). More than 1.2 billion peoples are undernourished which accounts roughly 14% of the world's population and 850 million are malnourished in developing countries (http://www.fao.org/state-of-food-security-nutrition/en/) and every six seconds somewhere a child dies due to hunger. Moreover, more people die every year due to hunger as compared to other serious diseases like AIDS, malaria and tuberculosis together (https://www.dosomething.org/us/facts/11-facts-about-global-poverty). Ultimately, malnutrition leads disease and devastating the lives of hungry poor economic peoples. Low income countries have highest number of malnourished children under age of five due to food unavailability and low economic capacity of people to acquire food (https://ourworldindata.org/hunger-and-undernourishment). Asia has largest number of undernourished population and it is the most food insecure region [3]. Whereas Sub-Saharan African countries are second most food insecure region with 239 million undernourished populations. Low accessibility power and poor economic capacity of population is main cause to increase food insecurity in developing economies [1,3], therefore these economies are in food insecure trap. Lack of food availability in local market is also a key reason for food insecurity in most developing economies [1-3]. At present world have a 6 billion population and it is expected that world's population would be 9.7 billion by 2050 (https://www.un.org/development/desa/en/news/population/world-population-prospects-2019.html). Hence, it is reported that to sustain food security would be difficult by 2050.

Agricultural is a crucial sector to increase the economic and social development in most developing and large agrarian economies [1,4,5]. It is also an important sector to enhance the rural development in most economies [1,3-5]. As agricultural is only sector that can at least feed the present and growing population. Hence world's policy makers are needed to give first priorities for agricultural sector and its development [1,4]. However, at present any economy is not ready to bear a risk caused by globalization, overwhelming industrialization, urbanization and high population growth [1,2,4]. As globalization is caused to increase the high competition across economies, while most economies are formulating their development policies to achieve high economic growth without giving a significant priorities to agricultural sector. While, to feed the growing population of the world must be a prime agenda for global policy maker and development thinkers [1,4]. As agricultural production system depends on physical factors, socio-economic characteristics, and factors related to technological change [1,4]. Agricultural production is a fruit of ecosystem services of land and water because without land and water agricultural cannot grow. Therefore, it is essential to give a significant efforts to maintain the quantity and quality of natural resources and ecosystem services to sustain agricultural production and farming activities in near future. Furthermore, it is seemed that arable land and copped area under cereal production and food-grain crop production have declined due to higher urbanization and industrialization [2]. As groundwater is a crucial source to meet the irrigation requirement for farming, while groundwater availability has also decreased as overexploitation of water at global level. As even without climate change world would be required 70% more food to feed nine billion

populations by 2050 (https://www.apo-tokyo.org/resources/articles/future-food-feeding-9-billion-in-2050/). Therefore, agricultural production activities would be in serious position in presence of climate change and change in socio-economic activities of people in future [2,4,6]. While the global growth rate of agricultural productivity has declined and it is expected to fall by 1.5% in the year 2030 and further to decline by 0.9% in the year 2050, as compared to 2.3% per year since 1961 (http://www.fao.org/3/a-ap106e.pdf).

Climate is a weather state which described the characteristics of particular region. Whereas, climate change is defined as long term variability in weather parameters (e.g. temperature, rainfall, solar radiation, humidity, wind speed, etc.) from normal in a long-period (http://www.fao.org/3/a1247e/a1247e02.pdf). In fact climate of a geographical region plays a vital role in crop choice, timings of sowing and harvesting, and production technologies but high variability in climatic variables have a negative implication on agricultural production management [3,7,8]. Therefore, high variability in weather parameters brought a numerous of problems for humanity [7]. In this regard, many scientific studies have proved that weather parameters are changing due to increase in GHGs emission in the atmosphere [4]. While, agriculture sector is a major contributors to GHGs emissions in the atmosphere at worldwide [4,7-9]. Most studies have illustrated that all sector of economy get adversely affects due to changing in weather parameters but agricultural is only one sector that directly affect due to climate change. Climate change would increase high disparities in cereal yields between developed and developing countries [2,4,7-9]. In developing economies, farmers do not have financial resources to apply new technology in cultivation, application of traditional methods in cultivation, large population are engaged in agriculture, and agricultural is major sources of national income [7,9]. Thus, agriculture sector would be in a serious position due to above-mentioned reasons in larger agricultural intensive economies. Moreover, it is observed that agricultural production need to be increased by at least 70% more to meet the global food demands by 2050. Subsequently, food security of world's population would be in a greater risk by 2050.

Agricultural is most dominant sector that directly gets affects by weather parameters [3,6-8]. Weather parameters play a crucial role to select an appropriate crops, suitable time for sowing and environmental condition for cultivation [10]. There are two groups of researchers which provide their opinion about climate change. First group of researchers argued that climate change is a natural phenomenon and changing since ancient era. That is why world's economies do not be worried from climate change. Second group of researchers suggested that climate change is happening at global level, therefore, global and national policy makers need to take precautionary actions to cope with climate change (e.g. 12 million hectare of agricultural land comes under serious degradation each year due to frequent droughts and floods at world level). Third group of peoples opined that low income economies especially which are large agrarian economies would be more vulnerable due to climate change as compared to developed world [4]. As low income countries are located at lower latitude than high income countries. In mid, high latitude and high income countries climate change would have positive impact on agricultural production or crop yields, whereas low-latitude and low income countries would experience a negative effect on agricultural production and crop yields [4,6-8,10]. This group of researchers are also reported that larger agrarian economies are needed to be more aware to develop advance technology to increase agricultural productivity and to mitigate the negative consequences of climate change to sustain their food security [2,7,10].

Aforementioned review show that climate change would have a negative impact on agricultural sector in developed and developing economies. Subsequently, food security of global population would be in risk. Furthermore, agricultural and farming activities would be high risk due to high population growth, urbanization, industrialization and labour migration from rural to urban area which are negatively affecting the arable area at world-wide. Thus, it is expected that food production will be decreased, therefore after a certain time aforementioned activities will be caused to increase food insecurity. Also, these activities may be caused to increase disturbance in natural resource and ecosystem services. Since, natural resource and ecosystem services are key source to sustain agricultural and farming activities. Hence, largely agricultural intensive economies need to control urbanization, overwhelming industrialization and population growth to preserve the natural resource and ecosystem services to maintain the agricultural sustainability and to sustain food security in future. Also, these economies are required to increase the science & technology in crop farming to increase the productivity of land. It would be

effective to increase food production and to increase food security in these economies. Application of green technology in manufacturing unit would be effective to sustain environmental development. For this, these economies need to give significant efforts towards science technological development which would be effective to mitigate the negative impact of climate change in agricultural production and farming activities. Also, science and technological advancement would be useful to discover the new way of farming which may be conducive to control environmental degradation and to abate GHGs emissions in atmosphere. Hence, it is suggested that world's economies must be given significant priority for environmental sustainability which would be useful to maintain the food security and further to formulate a development agenda in long-term in developing economies.

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