

Climate Change Impacts on Agricultural Sectors in the Central Dry Zone, Coastal and Delta Regions of Myanmar

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Abstract:- Myanmar is an agricultural based country and 70% of total population is relied on Agricultural sector. On the other hand, Agricultural sector is affected by climate changes especially in the Coastal and Delta Regions of Myanmar. Besides, Myanmar is currently transforming towards the democratic nations and the government is supporting to upgrade Agricultural Sector not only for local farmer but also throughout the country. There can be found that the lack of education, training and seminar, technological knowledge, modern technologies, inadequate modern farming methods and insufficient infrastructure respectively. If Government can provide effectively agricultural techniques, modern technologies and climate change policies on the challenges and difficulties, it will surely become a developed country within a short period.

Keywords:- Climate Changes, Regions, Agriculture, Challenges, Development.

I. INTRODUCTION

Climate change is the change of weather conditions due to natural processes, such as increasing droughts and temperatures not only in Myanmar but also around the world. According to Global Risk Index 2015, Myanmar is a country which effect of climate change every year. Recently, more extreme weather events would greatly effect in Myanmar used to face natural hazards such as cyclones, heavy rains, floods and extreme temperatures. In Myanmar, the climate change is major hazard on agriculture that causes not only by nature but also influenced by humans.

A. Research Points

- What are the current situations of climate change in Central Dry Zone, the Coastal and Delta Regions in Myanmar?
- What are the current policies and law to protect on agriculture from the climate change?
- What are the climate changes on Myanmar agriculture?

B. Research Methods

The research method used in this study is literature analysis.

II. LITERATURE REVIEW

A. Background Information of Myanmar

The Neighboring countries are Bangladesh, China, India, Lao PDR and Thailand. As per Worldometers 2020, Myanmar has 54,391,765 million people. According to Food and Agriculture Organization of the United Nations (FAO), majority of Myanmar people are relied on agricultural sector, which accounted for 37.8 percent of the GDP in 2020, accounted for 25 to 30 percent of export earnings, and employed 70 percent of the labor force.

The agriculture development is based on all the other sectors of development of the economy. Myanmar has four major agro-ecological zones (AEZs) that are the deltaic region, the coastal region, the central dry region and the hill region. Annual rainfall changes vividly throughout the country, with levels of up to 2,500 mm per year, in the delta region, less than 1,000 mm in the central dry zone, and the coastal regions receive up to 5,000 mm. Increasing temperature and heavy rain in Myanmar impact on production of Agriculture and food security. In addition, it will cause the production of yield crops (eg. rice, wheat, maize, soybean and groundnut. Climate change affected on the livelihood not only short-term production failures but also long-term production.

B. Agriculture Sector Development in Myanmar

Agriculture is the backbone of Myanmar economy, and more than 60 per cent of population is relying on it for their livelihoods. In the past few years, agriculture production plays a vital role in poverty reduction of Myanmar people. It is very important for future sustainable economy's growth. Agricultural production provides to general economic development in Myanmar especially in the employment and job opportunities for rural areas.

In South-east Asia, Myanmar is one of the most famous countries in fertile soils and rich water natural resources. The economy's Myanmar is influenced on Agricultural sector, involving 38 % of GDP.

However, not only farm productivity of Myanmar stay behind in the past but also farmers still remains poor. Most farmers live in the rural areas, and they do not have enough information. And, they have been restricted knowledge and the climate predictions that impact on agricultural production. And, they live in underdeveloped infrastructure.

These problems remain low income of the farm, low investments, and low productivity. Lack of government support is the main reason for farmers in rural areas. If the government would provide the necessary requirements for the farmers in particular land, fertilizers and equipment, there would not be a problem at all. At present, as the first priority, the government is focusing not only on political stability but also economic sectors. In addition, the government should create to get stable environment and stable currency for economic growth. Besides, the government needs providing free proper education, training and seminar to the farmers for the agricultural development.

Myanmar exports rice, maize, chick pea and sesame mainly. According to the World Bank (WB) Data, accounted for 38% of national GDP is countries agricultural sector and 23% of exports in FY 2016-2017. At Present, the main problems of Myanmar agriculture sector in rural areas are lack of deficiency knowledge and infrastructure. Similarly, all the problems are related to market and transport infrastructure. The peasants do not have adequate modern farming methods. They are uneducated and less knowledgeable than their regional partners. The government always cares the farmers in rural areas to educate Myanmar agricultural sector. Currently, the government cannot apply modern farming systems. Another problem is the deficiency of modified seed systems to upgrade the future agricultural productivity for export. However, the majority of farmers in the rural areas are carrying out their farming and agricultural business from their relatives or ancestors. In addition, Myanmar agriculture has to high risks because of the unstable economic conditions. In monsoon season, the famers face flooding annually. Not only the government is to play a major role in providing support to farmers but also the government facilitation is essential for sound agricultural development.

In the previous, the peasants have not been well-managed by large systems of the given facts, so they also do not aware whether they are able to maintain the systems as well or not. The peasants are loss how to advance the existing systems and also creating. In agriculture sector, it is needed a lot of time to develop the markets.

C. Effects on Agriculture

In Myanmar, the climate changes actually effect on the economic, productive, social and environmental sectors. For example, increasing temperature has a huge impact on agriculture especially in Dry Zone causing the severe drought in 2009 which was affected on major cereal crops. In 2010, severe drought declined water sources throughout the country and destroyed agricultural yields. Myanmar economy mainly relies on agriculture, which depends heavily on the rain water. So, if there is too much rain or less rain, it will impact on agriculture. Heavy rains will cause floods and less or no rain will cause droughts, which will impact on agricultural production. In 2010, the excessive sedimentation in Rakhine State destroyed paddy fields and declined harvests, as a result, about US\$ 1.64

million in damages. In addition, in 2011, the heavy rain and flooding in Ayeyawady and Bago Regions, Mon and Rakhine States caused damage around 1.7 million tons of rice. The deltaic and low-lying coastal rice cultivation areas will be exposed to increased salty, coastal erosion and flood. Therefore, the salty and flood are devastating to the agriculture, and they can create declined crops.

D. Legal Framework And Government Policies

➤ International Conventions

Myanmar is a State-party to all three Rio conventions which are

- The United Nations Framework Convention on Climate Change (UNFCCC),
- The Convention on Biological Diversity (CBD) and
- The United Nations Convention to Combat Desertification (UNCCD).

The UNFCCC mentioned that in order to stable greenhouse gas concentrations in the atmosphere at a level which would protect dangerous anthropogenic interference with the climate system. The UNCCD intended to improve the conditions of ecosystems, creation of worldwide benefits and establishing cooperation between national and international stakeholders.

➤ Climate Change Policy

In response to the UN “Earth Summit” in Rio de Janeiro in 1992, Myanmar improved a “plan of action”, called Agenda 21, in 1997. This plan of action, modeled on UN Summit guidelines, was to establish sustainable development in the 21st century. The key points in Myanmar’s Agenda 21 were:

- Developing water management and paddy rice planting strategies
- Promoting organic farming
- Stimulating research in order to develop crop varieties and to be more resilient to climate change.

In July 2013, Disaster Management Law was enacted in Myanmar. Other laws related to climate change mitigation or reduction of GHG emissions and pollutants are: Forest Law Act (1992), the Wildlife Act (1994) and the Protected Areas and Forestry Policy Statement (1995) respectively. In 2016, the Myanmar Climate Change Alliance (MCCA), Technical Working Group, and high level representatives of States and Regions involved in drafting the National Climate Change Policy.

In 2016, Climate Smart Agriculture Strategy (CSAS) adopted on adapting crop varieties and corresponding farming practices and managing the risk of disaster and loss of crops and income. In addition, Myanmar Sustainable Development Plan (MSDP) (2018-2030) has pledged Myanmar to a climate-sensitive development pathway and is accomplished by the new National Environmental Policy and Myanmar Climate Change Policy. Both policies made profit from technical support like international partners such as the United Nations Development Programme

(UNDP) and extensive public consultations throughout Myanmar.

The Ministry of Agriculture, Livestock and Irrigation (MOALI) carried out some procedures related to climate-change, such as adjusting cropping systems, using stress-resistant plant varieties and maximizing water use and efficiency. Because of these efforts and farmers' responses to climate change, crop differentiation and using stress-resistant varieties are common. The most widely driven adaptation and mitigation strategies are hybrid rice production technology. By using Good Agriculture Practices (GAP) for rice production is an adapted system of rice escalation, and alternate wetting and drying irrigation technique.

The sustainable escalation of rice production via efficient and effective natural resource management methodologies for higher rice productivity and profitability is the keystone for attaining this objective. The development of technologies in the agriculture, fisheries and livestock sectors with financial support should be encouraged institutional cooperation and coordination between international and national stakeholders to develop climate-smart activities in the agricultural, fisheries and livestock sectors.

➤ *Major Challenges of Climate change on Myanmar's Agriculture*

Climate change causes a serious risks in the agriculture sector via the enlarged frequency of natural disasters such as unusual rainfall, flooding, droughts, among others, especially in the regions of Ayeyarwady Delta Region of Myanmar.

The Ayeyarwady Delta Region is composed of Patheingyi, Pyawbwe and Bogale townships. In this region mainly, it is plentiful of rice but it faces challenges with aggravation and flooding. The coastal regions are covered round 15% of the land area of Myanmar. The negative effects of climate change on agriculture in Ayeyarwady Delta and Coastal Regions are rising temperature, varying rainfall pattern and successive flow regime and sea-level rise.

Since many decades, cyclones happened landfall alongside Myanmar's coastline every year. Flooding caused major hazards about 11% of all disasters in Myanmar and second one is fire. An increase major flood and storm flow occurred from 1910 to 2012 in the country. In recent years, flooding events have been more frequent as showed by the subsequent.

Heavy rains caused severe flooding in Myanmar as a substantial damage to agricultural land, houses and utility infrastructure, salt-water intrusion into agricultural lands and freshwater sources. In addition, it causes economic, social and environmental damage, loss of livelihoods and homes affecting about 3.2 million people and mortality of 138,373, and damage of USD 4.1 billion. Paddy rice is a traditional crucial source of income for farmers and

agricultural laborers in Ayeyarwady River Delta for the rice bowl of Myanmar.

III. FINDINGS AND DISCUSSIONS

Most of the people who live in rural areas are mainly focused on Agriculture. Therefore, the agriculture is very important for Myanmar people. In my paper, I just mainly emphasized on three research points such as the impact of climate changes on Agriculture, policies to protect on agriculture due to the climate change and the major challenges of climate change on agriculture. Currently, it can be found that the lack of education, training and seminar, technological knowledge, modern technologies, inadequate modern farming methods and insufficient infrastructure. In addition, the government is implementing the climate change policy and strategy to protect the agricultural sector from the impact on the climate change. It can be seen that some policies and strategies are very useful and effective in the Agriculture sector to prevent the climate change affection. In addition, there can be seen the Coastal and Delta Regions that are facing the flooding especially in the rainy season and have been damaged and destroyed lots of rice and crops in this region.

IV. CONCLUSION

It is needed many trainings for the farmers who are living in the rural/targeted areas to improve their knowledge and experiences concerning with climate changes effects on Agricultural sector. And then, the Government should create the market for the farmers to get the profits from the Agricultural production. Furthermore, it is necessary to contribute not only international partners but also extensive public consultations throughout the nations. Therefore, the development of agricultural sector is very important not only for the farmers who are living in the rural areas but also for all of Myanmar people.

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