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INDIAN AGRICULTURE AND CLIMATE CHANGE

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ABSTRACT:

Agriculture is the backbone and primary sector of our country. Due to climate change the agricultural sector heavily affected. When we address the long-term negative impacts of climate change and short- and medium-term impacts of climatic variability on agriculture, there is a need for sustained research on increased adaptation and mitigation, capacity building, development activities, and bringing necessary changes in policies. This study aims to find out the relationship between climate change and agriculture damages. The paper is emphasize and make a comprehensive study of economic impact by the way of analysing the data. The disasters such as Tsunami, Cyclone, flood and the other related natural disasters changes in livelihood, major casualties and the economic losses faced by the agricultural families. For this analysis used the secondary data, were collected from various institutions like National Statistical Organisation, various Agriculture Census reports and other documents and policy reports. Coastal flooding will affect people and agriculture and also affect tourism in India. Some fish and other marine animals will face extinction by 2050, affecting fishing community. Glaciers in Himalaya continue to shrink affecting run-off and water resources downstream. Other that agriculture, temperature variations will lead to outbreak of diseases as well and disturb the already poor health indicators of the country.

KEY WORDS: *climate change, livelihood, coastal flood, diseases, damage.*

1.1 INTRODUCTION

Agriculture is the backbone and primary sector of our country. Due to climate change the agricultural sector heavily affected. When we address the long-term negative impacts of climate change and short- and medium-term impacts of climatic variability on agriculture, there is a need for sustained research on increased adaptation and mitigation, capacity building, development activities, and bringing necessary changes in policies.

These actions have to be accompanied by long-term sustained actions towards generation and strengthening of strategic knowledge system in key impact sectors like water, agriculture, energy, health, etc. by building human and institutional capacity. Farmers in south Asia, often poor and marginal, are experimenting with the climatic variability for centuries.

There is a wealth of knowledge of a range of measures that can help in developing technologies to overcome climate vulnerabilities. There is a need to harness that knowledge and fine-tune them to suit the modern needs. Traditional ecological knowledge of people developed and carried which

have stood the test of time could provide insight and viable options for adaptive measures. In the last 100 years the mean annual surface air temperature of India has increased by 0.4-0.6°C reported decreasing rainfall tendency in both southwest and northeast monsoon seasons in most parts of central and northern India.

In contrast, peninsular parts of India particularly over the region from 9-16^{O}N encompassing the rice growing areas showed an increasing rainfall tendency. This increase was particularly strong during the northeast monsoon season.

1.2. OBJECTIVES AND METHODOLOGY

This study aims to find out the relationship between climate change and agriculture damages. The paper is emphasize and make a comprehensive study of economic impact by the way of analysing the data. The disasters such as Tsunami, Cyclone, flood and the other related natural disasters changes in livelihood, major casualties and the economic losses faced by the agricultural families. For this analysis used the secondary data, were collected from various institutions like National Statistical Organisation, various Agriculture Census reports and other documents and policy reports.

1.3. CLIMATE CHANGE AND ITS IMPACT IN CUDDALORE AREA

The 2015 South Indian or Chennai floods resulted from heavy rainfall of 1,218.6 mm generated by the annual Northeast Monsoon in November–December 2015. They affected the Coromandel Coast of Tamil Nadu and Andhra Pradesh, and the union territory of Puducherry, with Tamil Nadu and the city of Chennai particularly hard-hit along with the neighbouring districts of Cuddalore, Kancheepuram and Tiruvallur. Around 500 people lost their lives and over 1.8 million people were displaced.

With estimates of damages and losses ranging from nearly $3.12 billion, the floods of 2015 have been the costliest recent disaster which have taken place. Coastal hazards refer to events along coastlines that have the potential of damaging life, property and the environment. Coastal people become more susceptible to natural hazards such as floods, or tsunamis when land reclamation projects encourage settlement in imperilled low-lying areas, or when land-clearing and construction removes protective vegetation, reefs, or sand dunes (Sorensen and McCreary, 1990).

The key climate related risks include tropical cyclones, sea-level rise, and changes in temperature and precipitation in the context of the Indian coastal zones (NATCOM, 2004). Small changes in sea level, topographic elevation, erosive power, or movement of water can induce major environmental changes and create hazards to human activities (Huh, 1999). Based on this, in the present study, disasters which affected Cuddalore districts over a period from 2014 to 2021 are chronologically enlisted:-

1. Tsunami: 26th December 2004,
2. Cyclone Nisha: 25th– 29th November 2008,
3. Cyclone Thane: 25th– 31st December 2011,
4. Cyclone Nilam: 28th October 2012 – 1st November 2012
5. Drought 2013
6. Flood: 1st – 3rd December 2015.
7. Drought 2016
8. Cyclone Vardha 19 Decemebr 2016
9. Cyclone Gaja – 19 November 2018
10. Cyclone Nivar 23.November 2020
11. Cyclone Burevi 3rd December 2020
12. Unseasonal Rain Fall 2021

The catastrophic events of different kinds has brought down the Cuddalore district economy and livelihood of many vulnerable communities, such as farmers, fishermen, traders, small scale entrepreneur and changing in natural ecosystem and so on.

1.4 CLIMATE CHANGE AND ITS IMPACT ON AGRICULTURE

Recent surveys conducted and reports from Semi-Arid Tropics regions indicated that dry root rot in chickpea and charcoal rot in sorghum had increased many folds in last 2-3 years due to rise in temperature and prolonged moisture stress. Changes in temperature and variability in rainfall would affect pests incidence and their virulence on major crops. This is because climate change will potentially affect the pest/weed- host relationship.

- In 5 states viz. Andhra Pradesh, Arunachal Pradesh, Madhya Pradesh, Nagaland and Tripura, Agriculture and Allied activities contribute more than 30% in State Gross
- Value Added estimated for 2016-17 (at current prices). (Source: National Statistical
- Office)
- Number of operational holdings in the country is estimated at 14.64 Crore. (Agriculture Census 2015-16).
- The percentage share of Agricultural workers in Total workers is 54.6%. (Registrar
- General of India).
- Rural households are (57.8%) engaged in agriculture (Situation Assessment Survey of Agricultural Households, NSO).
- Cropping Intensity for 2015-16 season has been estimated at 141.25%.
- The small and marginal holdings taken together (0.00-2.00 ha) constituted 86.08% of the total land holdings in 2015-16. The all- India average size of holding is 1.08 ha. (Source: Agriculture Census, 2015-16)
- Position of women in agriculture 30.33% of total cultivators and 40.67% of agriculture labour are women.
- Only 13.95% of total operational holdings are operated by women. (Source: Agriculture Census, 2015-16)
- Demand for food grains projected by Niti Aayog (2020-21) and domestic production (4th advance estimates for 2019-20, DES).

According to IPCC report, India will experience decrease in seasonal mean rainfall and an increase in extreme precipitation during monsoon. This will increase both floods and drought. Freshwater resources will be affected due to combination of climate change and unsustainable practices. It is projected that there will be reduction in wheat yield in the Indo-Genetic plains; and substantial increase in heat stress for rice, affecting its yield.

Coastal flooding will affect people and agriculture and also affect tourism in India. Some fish and other marine animals will face extinction by 2050, affecting fishing community. Glaciers in Himalaya continue to shrink affecting run-off and water resources downstream. Other that agriculture, temperature variations will lead to outbreak of diseases as well and disturb the already poor health indicators of the country.

1.5 CONCLUSION

Climate change is one of the emerging issues and it affect our agricultural systems. Through science and technology and economic and environmental policy we can reduce the impact in terms of supply of compensation and maintain the environmental quality. Even though India is a rich in natural resources, but it faces drought, floods, cyclone, heat weaves, coastal salinity which have threats to the economy as well as sustainable development. In India, people are directly and indirectly highly associated with our agriculture and affected more. The extreme temperature affect more not only agriculture but also its allied activities. So, government should take proper initiatives to reduce the vulnerability of the climate change through qualitative and quantitative action and policies.

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