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CLIMATE CHANGE IMPACTS AND ADAPTATION MEASURES OF THE ANDAMAN AND NICOBAR ISLANDS

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ABSTRACT

The present study highlights the changes in rainfall pattern and temperature over the Andaman and Nicobar Islands from the historical and observational data. The challenges posed by climate change will have greater impact on these islands by way of erratic rainfall, persistent droughts and high temperature which results in severe water crisis particularly moisture deficit during summer months. Due to its remoteness, distinctive biodiversity, and coexistence of the mainstream population with tribal, understanding the weather and the impact of climate changes over these islands is very important. This is also true for the evolving climate resilient agricultural and biodiversity conservation plan.

INTRODUCTION

In recent years, the term "Climate Change" has become the most commonly used in scientific reporting. It is the observed changes in surface temperature, rainfall, evaporation, extreme events, and greenhouse gas emissions since the turn of the century. Climate change is defined as a significant and long-term shift in the statistical distribution of weather patterns over time spans ranging from decades to millions of years. Climate change and its impact on the remote Andaman and Nicobar Islands, which are home to vulnerable tribal groups, must be studied in order to develop appropriate adaptation strategies. The primary goal of this study was to compile various climate change studies and data pertaining to tropical islands, assess the impact of climate change on the ANIs, and identify different technologies to adapt to the changes in order to minimize their impact, particularly on island agriculture.

STUDY AREA

The Andaman and Nicobar Islands are located off the eastern coast of India in the Bay of Bengal and are precisely orientated in a chain from north to south. It comprised of 572 islands, islets and rocky outcrops, spreading in a linear distance in the Bay of Bengal between latitudes 06º and 14ºN and longitudes 92º and 94º E with a total areas of 8293 sq. km. and a coastline of 1962 km. They link the Indo-Malaysian region and are located in both South and South-East Asia. Many of these Islands were formed from coral lines, perhaps in conjunction with marine sediments. It experiences a hot and humid climate conditions.

CHANGES IN CLIMATIC PARAMETERS OF A&N ISLANDS AS A RESULT OF CLIMATE CHANGE

Precipitation

The climate on the islands is humid, tropical, and seaside. The closeness to the equator and the ocean ensures a hot, humid, and uniform climate. Both the south-west and northeast rainstorms bring rain to the islands. Between May and December, the most rain falls. The average annual rainfall is about 3000 mm. between 2001 and 2010; the Andaman and Nicobar Islands (ANI) experienced the most reduced precipitation of 2287.12 mm in 2002 and the most notable of 3254.76 mm in 2008.

Temperature

During a similar time period, the lowest mean greatest temperature at Port Blair was 30.20C in 2001, 2006, 2007, and 2008, and the highest mean most extreme temperature was 31.30C in 2010. Essentially, the lowest mean least temperature was 23.50 degrees Celsius in 2001 and 2002, and the highest mean least temperature was 24.60 degrees Celsius in 2010.

Humidity

Looking at the average relative humidity recorded in Port Blair from 2001 to 2010, the lowest humidity was recorded at 0830 hours with 76% in 2004 and the highest humidity recorded at 0830 hours with 80% in 2008 and 2010. Also, the most reduced mugginess was recorded at 1730 hours as 79% during 2004, and the most noteworthy moistness was recorded at 1730 hours as 83% during 2008 and 2010.

Wind Speed

According to an analysis of the mean breeze speed (km/h) observed at Port Blair between 2001 and 2010, the lowest breeze speed was 5.8 km/h in 2005, while the highest breeze speed was 9.8 km/h in 2008. Future Climate Forecast for Coastal Areas Including the Andaman and Nicobar Islands- In the coastline regions of India, there will typically be an increasing pattern in the temperature, precipitation (both in terms of intensity and number of windy days), and event of outrageous temperature.

Yearly mean temperature

With the exception of the country's northwest, where a cooling tendency is visible, most of India is exhibiting a warming pattern. Every season shows very large warming patterns, except after the storm, the pattern is positive but not severe. For the whole of India, a critical reduction in the number of recurrent cold days and an extension of the duration of hot days are estimated. The

warming model is a guess for the ocean surface temperature information of the northern Indian Ocean region. Seasons could be around 20 °C warmer around the 2030s.

Ocean level ascent

As indicated by IPCC AR4, the misfortunes of the Greenland and Antarctic ice sheets may have contributed to sea level rise between 1993 and 2003. The current rate has increased for with some ice sheets coming out of Greenland and Antarctica, which produce ice from within the ice sheets. The associated expanded ice sheet mass misfortune has frequently followed the diminishing, reduction, or loss of ice racks or the loss of skimming icy mass tongues. According to Assessment report, the Indian coastline is 7,517 km long, including the ANI coastlines for the Bay of Bengal and the Lakshadweep Islands in the Arabian Sea, with 81% (6,100 km) running along the Indian territory bounded by the Arabian Sea in the west, the Bay of Bengal in the east, and the Indian Ocean in the south. More than 40 million people live along this coastline. There are 13 coastal states and UT protected from sea level rise in the country, with about 84 coastal areas affected by the storm. With environmental change, it is predicted that the ocean level will rise further than it is now, and that the force and frequency of cyclonic exercises and tempest floods will increase, resulting in massive scope immersion of low-lying zones along coastlines, including Andaman and Nicobar Islands.

Adapting to changing climate

Adaptive capacity is the ability of the area of concern to adjust or respond to the changing conditions which also decided by the resources and technology available with the community (IPCC 2012).

- Individuals, communities, and governments must be strengthened through regional and international cooperation so that they can make more informed decisions about climate change adaptation and improve their long-term adaptive capacity. This include, protecting those ecosystems that are projected to suffer as a consequence of climate change and sea-level rise; and rehabilitating ecosystems degraded or destroyed as a result of socio-economic developments.

- In addition to autonomous adaptation of natural coastal systems, both restoration and rehabilitation of damaged mangrove and reef ecosystems as 'planned' adaptation mechanisms should be aimed to increase natural protection against sea-level rise and storms, and to provide resources for coastal communities.

- Some of the appropriate adaptation strategies for agriculture under island condition are;

- The key options to address climate change related problems rest on agricultural diversification through the use of water and nutrient efficient cultivars, modifications in existing cropping systems and adoption of site specific integrated farming systems to diversify the fanning systems and also harness the mitigation co-benefits.

- The Integrated Farming System (IFS) promises to improve local communities' adaptive capacity by providing food, nutrition, livelihood, and income to farmers while also lowering the risk of crop failure in monocropped areas due to weather fluctuations and biotic factors such as pests and diseases.

- Processing and value addition of agricultural products will considerably reduce vulnerability of island agriculture and provide stability to income.

- Rain water harvesting through lined ponds, tank cum ring well, and check dams and its efficient use. Land shaping methods in the coastal areas will address both land degradation and rain water harvesting.

- Utilization of improved native breeds of livestock which are well adapted to the local conditions.

➢ Encourage active participation of local communities in capacity building and adaptation strategies so as to enhance their adaptive capacity. The experience of adapting to inter annual variability should be used in dealing with longer-term mean changes in climate and sea level.

➢ Enhancing adaptive capacity will only be successful when it is integrated with other policies such as disaster preparedness, land-use planning, environmental conservation, coastal planning, and national plans for sustainable development.

CONCLUSION

Climate change will have a greater impact on these islands through erratic rainfall, prolonged droughts, and high temperatures, as well as changes in the political environment in which they operate. This mainly manifests itself in the form of habitat and biodiversity loss. In addition to facilitating natural adaptation, planned activities will improve the resilience of communities to climate change. This requires a deliberate and adaptive approach to managing the islands' weather and natural resources.

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