

Influence Of Climate Change and Its Awareness in Agriculture Field of Tamil Nadu Region

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Abstract- In Tamil Nadu majority of the people depend on agriculture for employment which is highly perceptive to climate volatility. Climate and Agriculture are interrelated processes. Climate change is projected to have evident influence on the factors affecting agriculture, including temperature, precipitation and surface runoff. The overall consequence of Climate Change on agriculture will depend on the balance of these effects by the power of the Intergovernmental panel on climate change. This study aims to evaluate the impact of climate variables on agriculture and bring out the consciousness to the farmers who are quitting from their agricultural activities due to this correspondence of ill effects and helps to prolong their life of human beings for present and future generations.

Indexed Terms- Climate Change, Impact, Yield, Temperature, Surface runoff.

I. INTRODUCTION

The climate is one of the foremost determinants of agricultural production. Climate change affects the productivity throughout the world. The climatic variability is caused by human activity (directly or indirectly) that alters the atmospheric composition at the global scale. Any change in the climate directly affects the crop yields and production at a significant scale. As a result of the industrial revolution, many countries rapidly utilized the fossil fuels. The natural buffering system (forests) for climate change forests were destroyed indiscriminately by the human activities in the past years, which had tremendous impact on the climate system. The greenhouse gas production could cause the mean overall temperature to rise by another 1.5° C to 6.00° C. The main reasons for climate change are Industries, transportation, generation of power which influences the increase in

the atmospheric temperature. Agriculture, forestry and fisheries are the sectors impacted by the Climate Change and they also contribute to the emission of Greenhouse gases. Agriculture accounts for 15 percent of overall greenhouse gas production from fertilized soils, biomass burning, rice production as well as manure and fertilizer production. According to Intergovernmental Panel on Climate Change (IPCC) mitigation is defined as “An anthropogenic intervention to reduce the sources or enhance of the Greenhouse Gases”. Indian Council of Agricultural Research (ICAR) has given high priority in understanding the impact of Climate Change and developing adaptation and mitigation strategies through National Project on Climate Change (NPCC) in order to meet the challenges posed by Climate Change on the agricultural system. At present, though there is no systematic study to assess the direct and indirect effects of climate change on agriculture and allied segment, this sub divisional plan will enable the state to evaluate the vulnerability of the state to climate risks, prioritization of research and development issues and successful assessment making to decrease risks through variation.

II. STUDY AREA

The Tamilnadu, a state of the Indian sub - continent was chosen as the study area. The Tamilnadu lies between 7° 91' N to 13° 65' N latitude and 76° 17' E to 80° 82'E longitude. Agriculture, a predominant sector, contributes to about 10 % to 12 % of the state and provides employment for about 65 % of the rural work. At present, the gross commended area is accounting for nearly 51 % of the total geographical area of the state. Food crops account for 72 % of the gross commended area, of which nearly half is under rice cultivation.

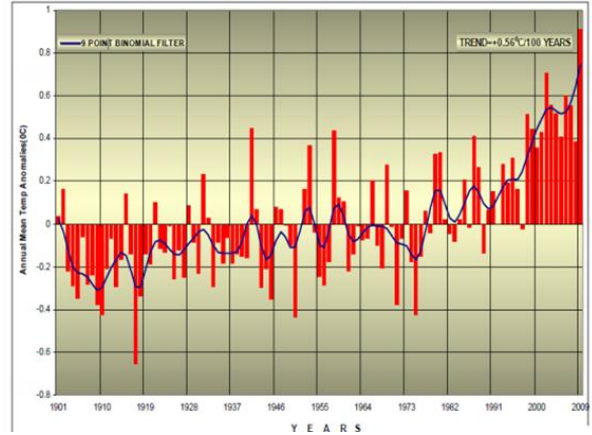


Figure 2. Observed climate change in India



Figure 1. Location of the study area

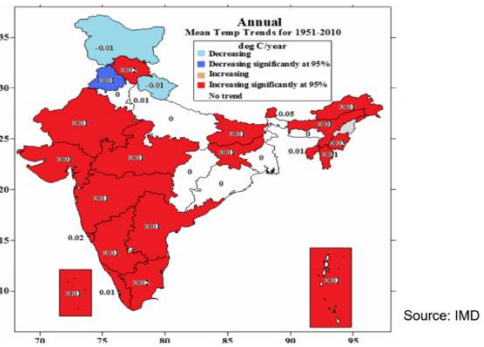
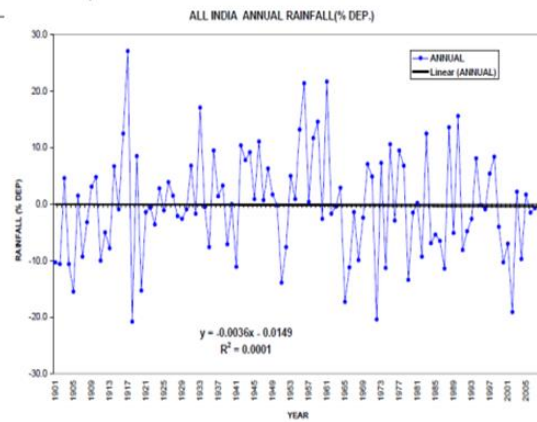


Figure 3. Mean temperature trend in India

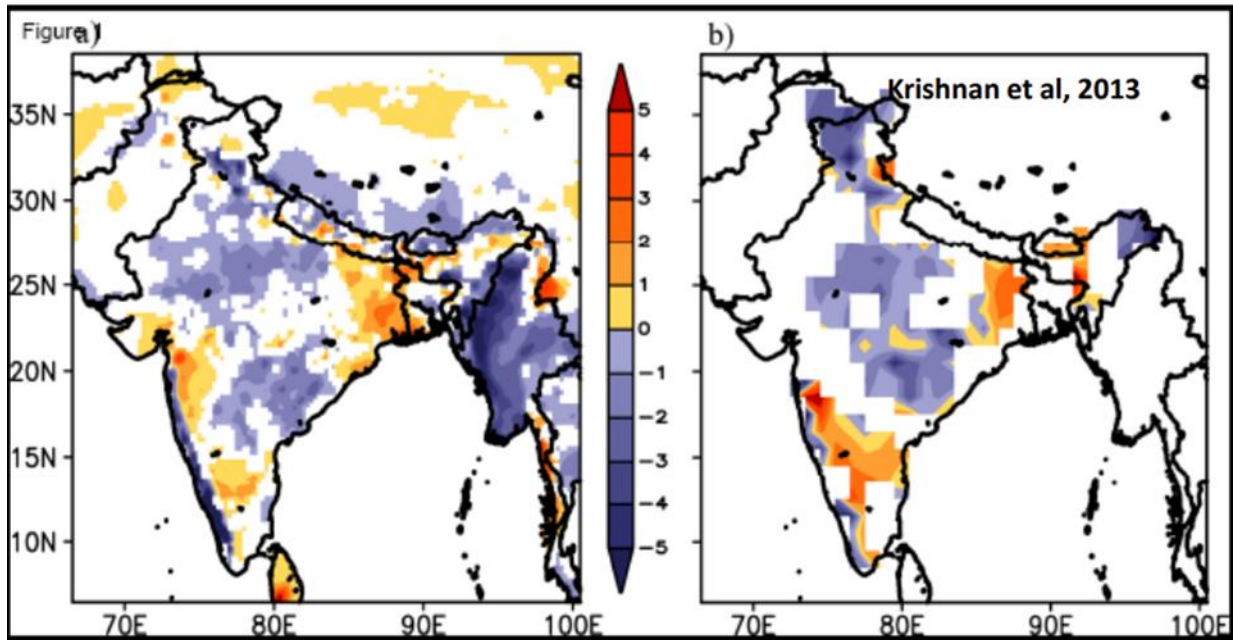
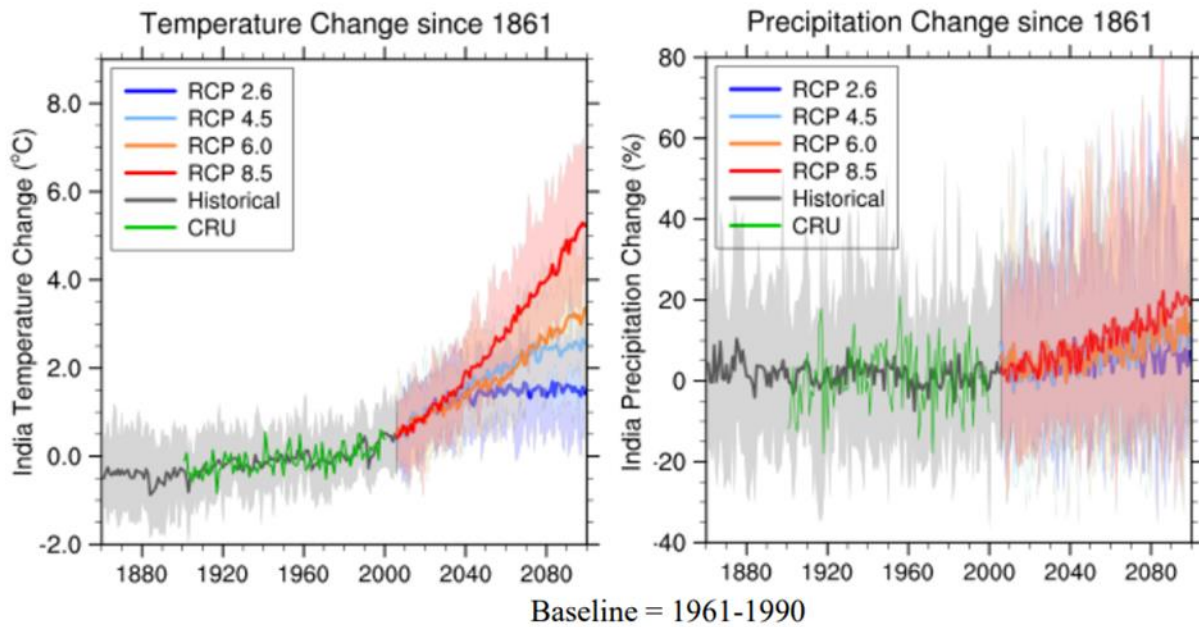


Figure 4. Monsoon rainfall India



Chaturvedi et al., (2012)

Figure 5. Temperature and precipitation projections over India

III. METHODOLOGY

3.1 Temperature Projections

3.1.1 Maximum temperature

The maximum temperature over Tamil Nadu is projected to increase by 1.5° C, in the years 2050 respectively, with reference to the baseline 1975-2000. As per the projections there will be an increase in temperature of about 1.5°C over the North Western districts of Coimbatore, Nilgiris, Tiruppur and western parts of Dindigul District and there will be an increase of about 0.5° C is seen along the eastern parts of coastal districts mostly over Kanyakumari, Nagapattinam, Tirunelveli and Ramanathapuram.

3.1.2 Minimum temperature

Projection of minimum temperature over Tamil Nadu as a whole for 2050 with reference to baseline 1975-2000 are likely to increase by 1.5° C respectively. There will be a minor change in the minimum temperature in the western parts of the districts and the region closer to the coast. There will be a general rise in temperature ranging from 0.5° C to 1.5° C for the period 2010 to 2050. There will be minimum increase of minimum temperature in the southern districts of Kanyakumari and Tirunelveli and maximum increase of minimum temperature in the central interior districts Karur, Tiruppur and Namakkal.

Various meteorological data were collected and analyzed for better understanding of the effect of meteorological parameters on climate change and finally on crop yield.

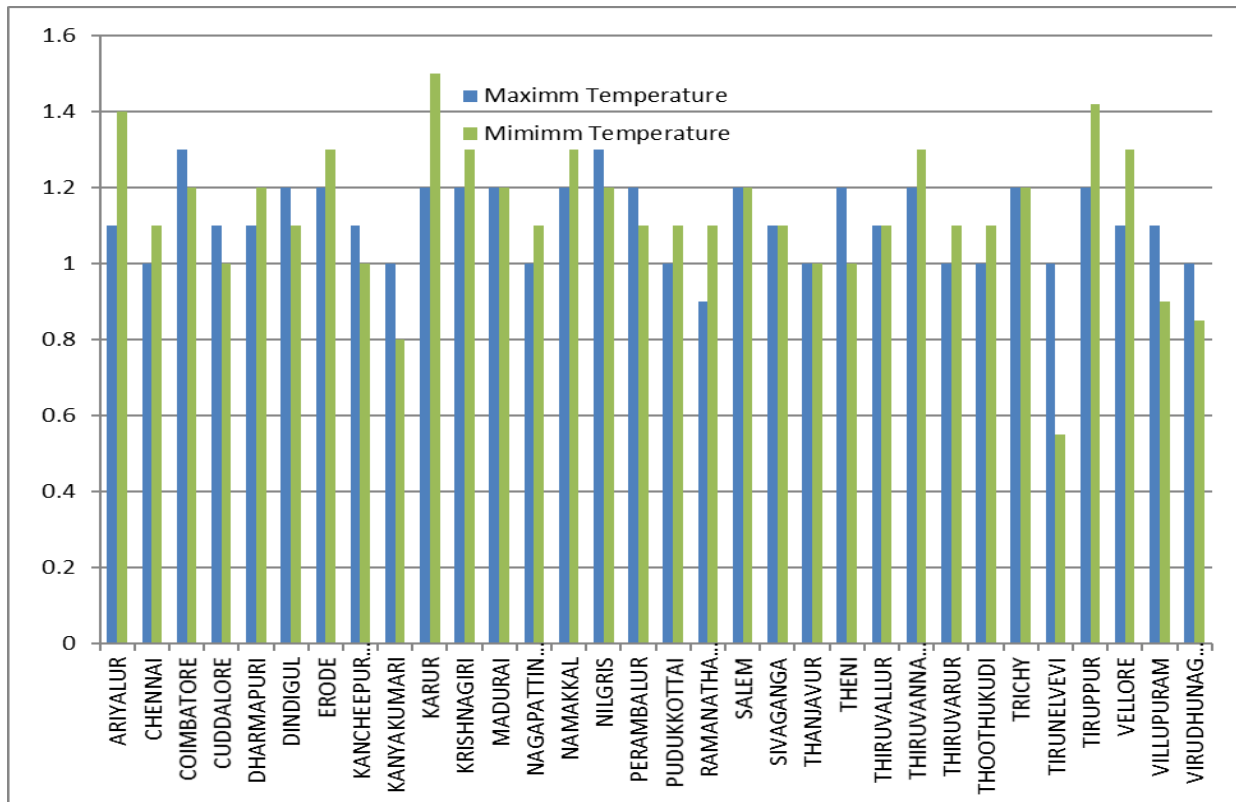


Figure 6. Increase in temperature for 2010-2040

3.1.3 Impact on Crop Production

In Tamil Nadu, 23 percent of the state’s income comes from the agriculture and allied sectors, which is declined over these past years. The sector, which grew at 15.30 % during 2006 - 2007 declined to - 4.46 % in

2007 - 2008 due to the crop damages caused by natural calamities. However, still about 42 % of the state population is dependent on this sector for livelihood. Hence the growth in agriculture is important not only to ensure food security, but also for higher living standards as well. Hydro meteorological events such

as droughts, extreme rainfall events and cyclones impact the growth of the agricultural sector due to reduced availability of water and declining crop area (from 33% of available land area in 2000-01 to 31% of total land area in 2010-11). Further, small land holdings, deterioration in soil health due to depletion of topsoil & decline in organic content, decrease in cropping intensity and shortage of labour force besides reluctance to work on the farms and poor adoption of crop management practices etc. impacts the agriculture. The net sown area was at its peak during the year 2001-02 and 2010-11 in Tamilnadu, but due to the extreme drought in 2002-2003, the net sown area as well as the total production dipped significantly.

Since then, the net cultivated area has not recovered. However, with the increase in area under assured irrigation from 54 % of gross sown area in 2001-02 to 58 % in 2010-11, the productivity of a majority of the crops such as cereals, pulses, oil seeds etc. is on the rise except for a nominal decline in rice and pulses. In 2011-12, the total irrigated area which 56 % was irrigated by ground water and the rest by canals, tanks and other modes of irrigation. In case of rice, 93 % of the gross cultivated area is irrigated. In case of pulses about six percent of the gross sown is irrigated. In the case of oil seeds, 38 % of the gross sown area is irrigated.

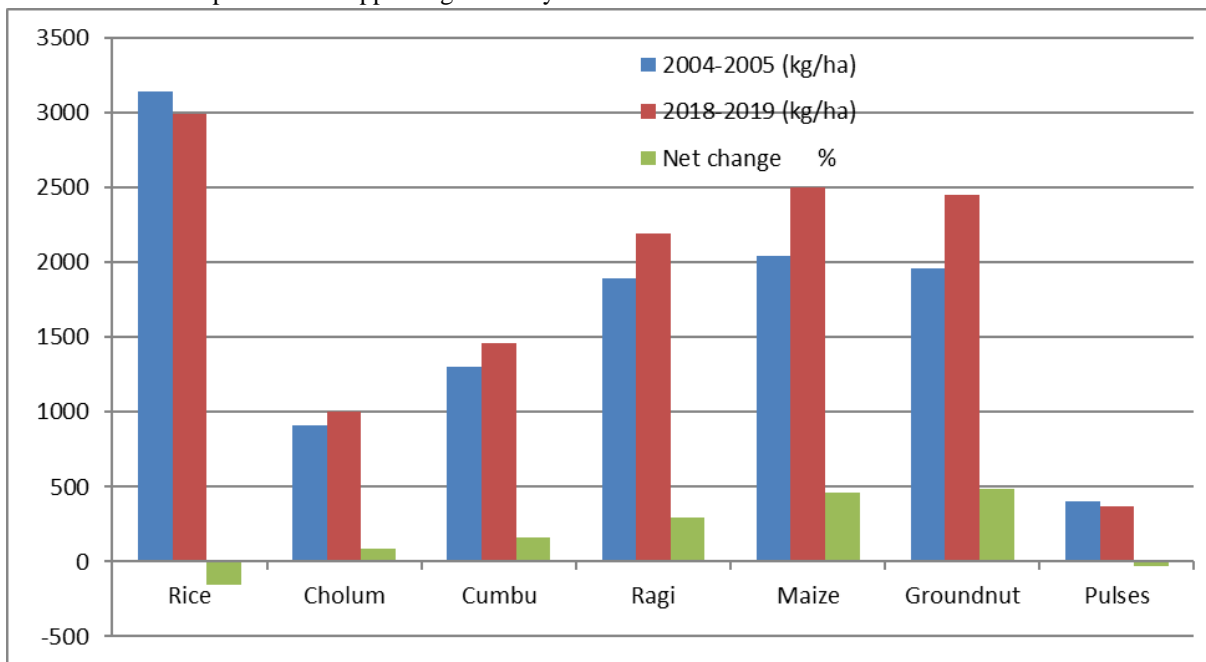


Figure 7. Change in crop yields during past decade due to climate change

IV. RESULTS AND DISCUSSION

In order to achieve the objective of this work and to develop a monitoring based meteorological model for maximum crop yield, several important issues are essential and has to be taken into consideration, to provide satisfactory results like, proper planning and study of the region of interest, meteorological data collection and processing etc. The study found that increase in temperature by about 20° C will reduce potential grain yields in most places. Northern India is less impacted by the climate change because of the higher potential productivity. Climate Change will

also lead to boundary change in areas suitable for growing certain crops. As there is no coping mechanism for rainfall variability the rain-fed crops are affected adversely than irrigated crops. The baseline climate influences the difference in yield. The potential wheat yield is decreased from 1.5 to 5.8 percent in subtropical environment and the decrease is relatively higher in tropical regions.

CONCLUSION

Agriculture and Climate Change are interlinked with each other since the crop yield and quality, fertility status of soil is influenced by the Climate Change and

affects food and nutritional security. The main challenge for Indian agriculture is to develop or adopt adaptation and mitigation strategies for the potential changes in temperature and precipitation and extreme events without compromising productivity and food security. Sufficient investments should be made to support Climate Change adaptation and mitigation policies to develop strategies that mitigate the negative impact of Climate Change. Interlinking of possible rivers from northern to the southern India region solve the problems of drought. Moreover, as a result of the impacts of climate change concluded the farmers decided to go for suicide. These issues should be controlled and made possible to form a green earth. Now, after taking all the probable reasons under consideration of the above study, a conclusion has been arrived that the greenhouse effect and global warming could be the most appropriate reason of climate change, which is accelerated due to anthropogenic activities.

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