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AN ANALYSIS OF CLIMATE CHANGE ON CULTIVATION AND CROPPING PATTERN IN TAMIL NADU – A CASE STUDY ANALYSIS

Dr. S.Palani*

A.Senthilraja**

Abstract:

India is a growing kingdom with majority of agricultural populace and high cultivation place while compared to the alternative developing nations. in line with 2011 census 71 in line with cent of the Indian humans are living in rural areas and by and large they may be hired in agriculture and related activities. it is a number one supply available for generation of profits and employment in rural vicinity. The increase rate of agriculture has come all the way down to 1.1 percentage from 4.69 percent in evaluation to the 6 percent boom charge of Indian economic system for the last ten years. round 93 percent of them are small farmers having land holdings of less than 4 hectare however the common farm size is simplest 1.fifty seven hectares and that they domesticate almost fifty five percent of the available land and the reasons are because of business growth in India more quantity of commercial gadgets have been began inside the beyond decades. In recent years, the climate modifications had been a complicated trouble because of overseas weather coverage. The climate adjustments have an effect on the prevailing cultivating regions due to unscheduled rainfall, excessive temperature, high tensed cyclones and so on. this example observe made on try to make an assessment approximately the level of modifications happened in the cultivation area, temperature and rainfall and its consequences at the region of cultivation and cropping sample in observe vicinity.

Key Words : Climate Change, Cultivation, Rainfall, Agricultural Production,Indusrial growth.

* **Associate professor & Head**

** **Research Scholar,**

Department of Economics , Mannar Thirumalai Naicker College, Madurai.

Introduction :

Over the last decade, scientists have extensively studied the greenhouse effect, which holds that the accumulation of car-bon dioxide (CO2) and other greenhouse gases (GHG's) is expected to produce global warming and other significant climatic changes over the next century. Numerous studies indicate major impacts on agriculture especially, if there is significant mid-continental drying and warming in Indian soil. The earth's surface temperature is slowly rising due to human activities, which are releasing heat-trapping gases, notably carbon dioxide and methane, into the atmosphere The planet earth is warming due to increased concentrations of heat-trapping gases in atmosphere. Snowy winters in some parts of the world do not alter this fact. during the last decade, scientists have appreciably studied the greenhouse effect, which holds that the buildup of automobile-bon dioxide (CO2) and different greenhouse gases (GHG's) is expected to supply international warming and different substantial climatic changes over the following century. numerous studies suggest major influences on agriculture in particular, if there is large mid-continental drying and warming in Indian soil. The earth's floor temperature is slowly rising because of human sports, which might be releasing warmth-trapping gases, significantly carbon dioxide and methane, into the environment. From various studies reports that in 2100 the temperature become expected to elevate and reach 2 ±1 C, other climatic impacts ultimate constant. this may be the fastest fee of climate exchange the earth has experienced because the begin of modern-day civilization. climate trade is one of the best demanding situations of the arena in current scenario. Fossil fuel burning and deforestation have emerged as predominant anthropogenic sources of growing atmospheric carbon dioxide (CO2) and different inexperienced-residence gases and consequential global warming. Proxy facts of variability in temperature, precipitation, sea degree and severe weather activities provide collateral proof of worldwide climate trade. certainly, there may be compelling, complete, consistent, and objective evidence that people are changing the weather in approaches that threaten our societies and the ecosystems.

clinical information is now remarkably coherent on following essential conclusions approximately weather trade:

The planet earth is warming due to improved concentrations of heat-trapping gases in ecosystem. Snowy winters in a few components of the world do now not adjust this reality.

maximum of the increase in the attention of green-house gases over the past century is because of human activities, specially the burning of fossil fuels and deforestation.

herbal reasons usually play a function in converting earth's weather, but are actually being outcompeted with the aid of anthropogenic changes.

Warming of the planet will cause many different climatic styles to trade at speeds exceptional nowa days, such as increasing costs of sea-degree upward push and alterations within the hydrologic cycle. growing concentrations of carbon dioxide are making the oceans more acidic.

The aggregate of those complicated climate adjustments threatens coastal communities, towns and rural systems, our food and water resources, marine and freshwater ecosystems, forests, high mountain environments, and so forth.

weather alternate affects all the livelihood in our each day lives, influences the performance of plenty of industry, and results in billions of pounds of harm international every year. In many nations most of the people is turning into worried as press reports, private enjoy and anecdotal data all point to an growth in the frequency and severity of extreme climate occasions linked to climate alternate. Many critiques had been expressed at the subject from the doom weighted down to the dismissive. climate and climate have an effect on us all in our every day lives and as a minimum 70% emissions from industries. here climate manner the common nation of the weather over intervals starting from months to centuries. In recent years the phrase climate trade has come to be familiar as environmental extremes frequently hit the headlines.

Climate change affects all the livelihood in our daily lives, impacts the performance of much of industry, and leads to billions of pounds of damage worldwide each year. In many countries the general public is becoming concerned as press reports, personal experience and anecdotal information all point to an increase in the frequency and severity of extreme weather events linked to climate change. Many opinions have been expressed on the subject from the doom laden to the dismissive. Climate and weather affect us all in our daily lives and at least 70% emissions from industries. Here climate means the average state of the weather over periods ranging from months to centuries. In recent years the phrase climate change has become familiar as environmental extremes regularly hit the headlines. The United Nations Framework Convention on Climate Change uses the term to describe change brought about only by human activities, in particular by those processes that emit the heat-trapping gases carbon dioxide and

methane into the air. A more generic usage, common in the scientific community, refers to change brought about by any source, human as well as natural.

Statement of the Problem:

climate change affects all the livelihood in our everyday lives, influences the overall performance of an awful lot of enterprise, and ends in billions of kilos of harm international every 12 months. In many nations the general public is turning into involved as press reports, personal enjoy and anecdotal data all point to an growth in the frequency and severity of excessive climate events related to weather alternate. Many critiques had been expressed on the concern from the doom weighted down to the dismissive. climate and weather have an effect on us all in each day lives and at least 70% emissions from industries. right here weather manner the common state of the climate over periods starting from months to centuries. In current years the word climate change has become familiar as environmental extremes often hit the headlines. The United nations Framework convention on weather exchange uses the time period to explain alternate delivered about most effective through human sports, specifically by way of those methods that emit the heat-trapping gases carbon dioxide and methane into the air. A more frequent utilization, commonplace in the clinical community, refers to exchange added approximately by way of any supply, human as well as natural.

Importance of the Study :

India is a agricultural u.s.a with a high population. during the historic development of numerous thousand years huge regions of woodland and grassland had been transformed into arable lands. At gift, some of bioclimatic models have been used to assess the capacity affects of weather trade at the distribution of fundamental atmosphere complexes on a international scale (Holdridge, 1967; Budyko, 1974; Emanuel, Shugart & Stevenson, 1985; Prentice et al., 1992). but, these kind of international fashions have sizable boundaries for spotting vital seasonal and neighborhood components of flowers and climate. changes in temperature and precipitation will alter the hydrological cycle, which impacts runoff, moisture availability, sedimentation and erosion and, moreover, the recycling of natural count and nutrients of the soil. accordingly, it's far necessary to expand and then to use the nearby bioclimatic model for investigating and

estimating the capacity scale, such as inside the volume of cropping sample and cultivation areas within the observe location.

Objectives of the Study:

- To study the climate changes and cropping pattern in the study area.
- To analyses the rainfall level in the study area.
- To give suggestions to reduce the cost of cropping pattern.

Table 1

Climate Change and Rainfall

Year	**Changes in Temperature (+increase, -decrease) in °C**	**Rainfall (+increase, -decrease) in mm**
2001-02	0.52	-88.3
2002-03	0.71	-17.7
2003-04	-0.11	129.6
2004-05	-0.68	-6.4
2005-06	0.20	296.8
2006-07	0.21	-112.1
2007-08	-0.95	82.3
2008-09	0.68	-106.2
2009-10	0.76	-385.0
Overall changes	**1.34**	**-207**

Source: *Computed Data from Assistant Director of Statistics, Madurai*

Climatically weather condition is important determinant for the rainfall of the area. Many studies prove that there is a adverse relationship will be there between the changes in temperature condition and rainfall of the study area. Here, we use the computed data set of changes in climate condition (temperature) and rainfall of the Madurai District from Assistant Director of Statistics, Madurai.

The table 1 discuss about the overall changes in temperature and rainfall in the Madurai district. The result reveals that there are a lot of fluctuations in the rainfall and temperature. The results clearly pointed that when are the temperature has increase in the environment there is a gradual decrease of rainfall overall the study period indicates the temperature has increased at 1.34° due to temperature increase the rainfall has reduced to 207mm. This result has proven that the change of temperature in the atmosphere have the inverse relationship in the rainfall of the study area.

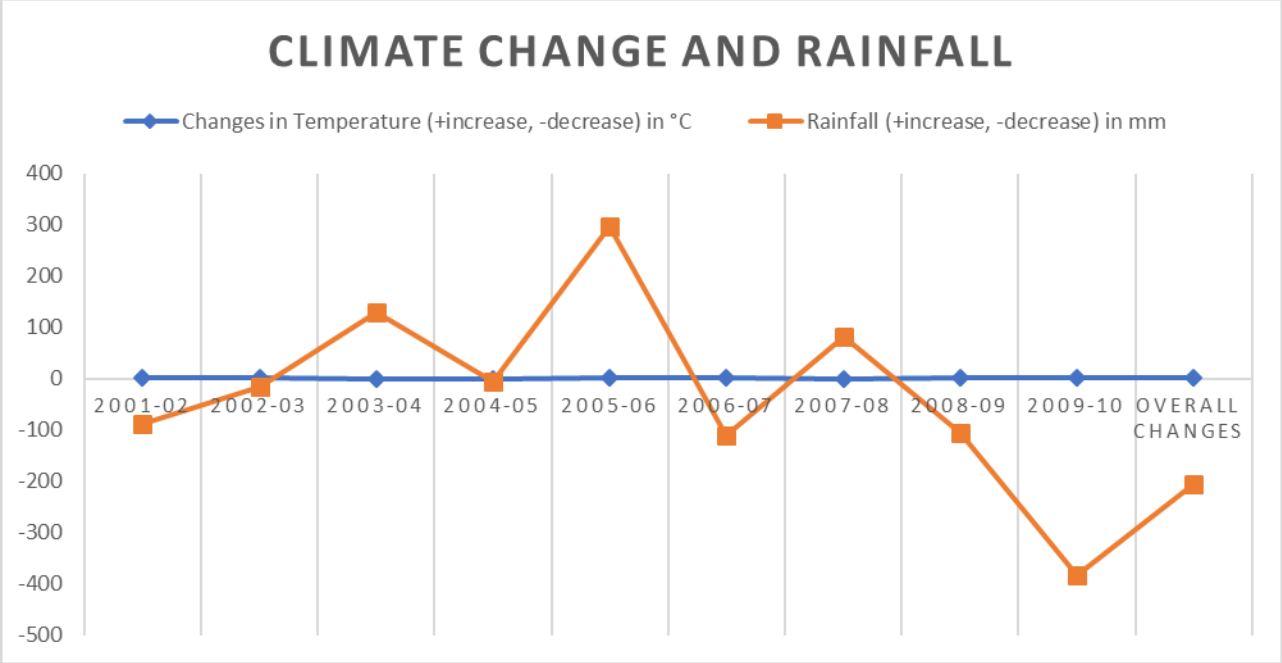


Table 2

Changes in Cropping Pattern of the Madurai District

(in Hectares)

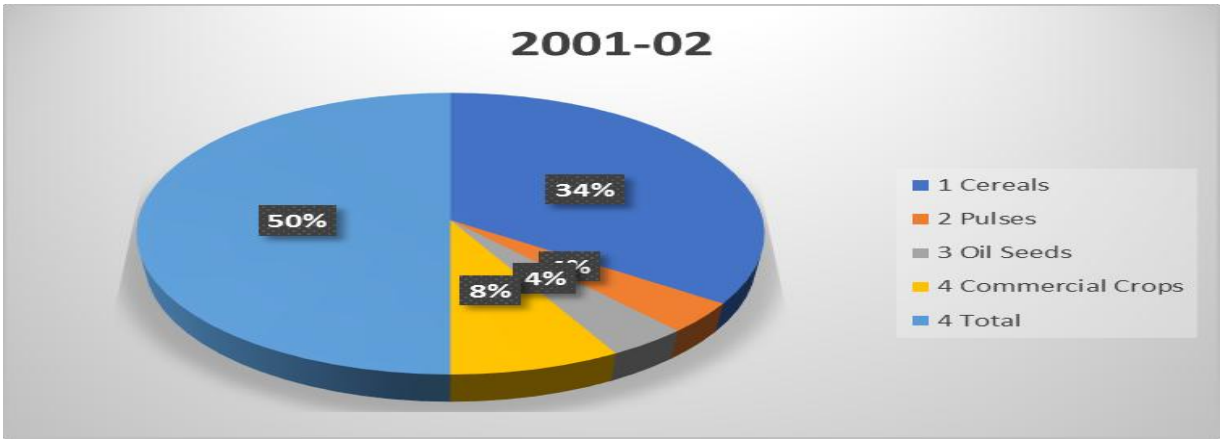
S.No	Varity of Crops	2001-02	2010-11	Changes
1	Cereals	81898	80105	-1793
2	Pulses	8578	6076	-2506
3	Oil Seeds	8892	3653	-5239
4	Commercial Crops	19070	12832	-6238
	Total	118438	102666	-15772

Source: *Department of Economics and Statistics, Chennai*

Cropping pattern of the land may depend upon the climate condition and quantum of rainfall in the localities. Here, the table was discussed about the changes in cropping pattern in the Madurai district. The crop cultivation has divided into four major categories namely cereals,

pulses, oil seeds and commercial crops. Paddy, cholam, cumbu, ragi, varagu, samai, maize are comes under cereals. Redgram, bengalgram, greengram, blackgram are the crops of pulses. Groundnut and gingelly are the components of oil seeds and remain cotton; sugarcane and banana are the commercial crops of the Madurai district. The grouping of crops is depends on the major cropping pattern of the study area and the availability of data.

The set of data for area of crops cultivation used for the years 2001-02 and 2010-11 are obtained from the official website of the department of economics and statistics, Chennai. During the study period there is a downward trend in the area of cultivation in the study area. The above statistics reports that totally 15772 hectares of cultivatable land were used for other agricultural purposes and left with unused due to lack of irrigation facility in the area of cultivation. During the past decade the temperature was increased in Madurai district and amount of rainfall also reduced in this juncture rainfall and climate condition of the locality has severely affected the cropping pattern and area of cultivation.



Major Findings :

- Totally 1.34°C temperature was increased for the last ten year (2001-02 to 2010-11) period.
- Overall change in rainfall level was 207mm in the last ten year period.
- Regarding the crop cultivation overall 15772 hectares of crop cultivation area were reduced in past ten years.

Conclusion :

The advance researches are had to take a look at the intense occasions and the consequences of amassing evidence on their consequences from lengthy-time period observations and experimental research in various ecosystems. the prevailing takes a look at concludes that there's an instantaneous and unfavorable relationship is there between the climate change and rainfall and those two factors are affecting the cropping sample of the have a look at area. it's miles important to remember information on historic or projected extremes of simulated occasions though this is missing in many event-primarily based experiments like climate alternate and cropping sample of the one of a kind regions. otherwise, the predictive electricity of the results may be constrained in agricultural area. event-primarily based studies on climate extremes will contribute substantially to the talk as to whether or not local weather extremes are relevant to the rainfall and cropping sample with long-time period ecological influences. Collaborative clinical efforts will contribute to our knowledge of the role of climate exchange and its influences into the agricultural areas.

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