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An Empirical Analysis of Global Warming and it's Impact on Agriculture

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INTRODUCTION

Climate change Global warming Agriculture India Adaptation Introduction Climate change and agriculture are interrelated processes, both of which take place on a global scale. The overall effect of climate change on agriculture will depend on the balance of these effects. Due to global warming, the frequency of droughts in several tropical countries has increased whereas flooding in several countries severely disrupted the food production and the carrying capacity of the biosphere. Assessment of the effects of global climate changes on agriculture might help to properly anticipate and adapt farming to maximize agricultural production. This paper emphasizes how agricultural growth and sustainability has to be achieved, while coping with the climate change phenomenon. Climate change is likely to reduce yields of most crops in long- term. In short-term effects may be small policy and financial support Key words Thus, there is much concern about future climate changes.

One of the most important challenges of the 21 Changes in global supply and. Increased climatic variability could cause significant fluctuations in production even in short-term. Adaptation strategies can help minimize negative impacts. These need greater research,

Demand for climate change. Climate change is defined as phenomenon; various crops provide new challenges tochangein climate over time, whether due to natural farmers worldwide.Variability or as a result of human activity. Climate change there are no hard facts about what will definitely beand agriculture are closely related processes and the result of increase in the concentration of greenhouseresponseof climate change in developed and developinggases within the atmosphere and no firm time scales arecountriesvaries greatly. The most important climate known Agriculture is an important sector to consider inchange in recent times is increased levels of greenhouse and terms of climate change. This paper attempts to take and gases such as carbon dioxide, methane, ozone, nitrous overview of the impacts of climate change on agriculturaloxide and CFC. Global warming (i.e., systems. It also emphasizes how agricultural growth andincreased greenhouse gases) is projected to havesustainability has to be achieved while coping with thesignificant impacts on conditionsaffecting agricultureclimate change phenomenon.Including increased global mean surface temperature, glacialrun-off, precipitation and the interaction of these agriculture and Climate Agricultureplays the key roleelements. The overall effect of climate changesin economy and provides food and livelihood activities toagriculture will depend on the balance of this effect to much of the country's population. While, the magnitudeDue to global warming, the frequency of droughts in of i.

OBJECTIVES

The impact's of objective for study of global warming

- To understand the impacts of agricultural global warming.
- To improve awareness and understanding of climate change amongst citizens;
- To demonstrate that daily activities can collectively make a big difference and that each individual has a role to play in the fight against climate change.
- To find the specification of agricultural need to cultivate the production before global warming.
- And analysis the climate needs to agriculture cultivate.

SCOPE OF STUDY

- Agriculture is extremely vulnerable to climate change. Higher temperatures eventually reduceyields of desirable crops while encouraging weed and pest proliferation. Changes in precipitation patterns increase the likelihood of short-run crop failures and long-run production declines.

- Farmers are starting to see a decline in crops because of the extreme changes in temperature. The changes in temperature reduce both agriculture and crops. The heat from global warming will also cause pests to multiply fast which will also lead to less crops.

STATEMENT OF THE PROBLEM

- The day to day increase in industrialization and technological advancements have always had anegative impact on the nature.
- Global warming has been a very difficult hurdle to tackle. This project helps us to understand allthese negative impacts on agriculture.
- The positive impacts of global warming include the increase in crop productivity due to fertilization effect caused by the increase in carbon dioxide concentration
- In the atmosphere, expansion of the areas available for production of tropical and/or subtropical crops, expansion of two-crop farming due to the increased

LIMATATIONS OF STUDY:

- Limitations towards a fully developed agricultural based economy include price instability, income instability and government intervention, as explained by D Gale Johnson. The instability of farm prices results from several factors.
- It is not enough simply to identify the limiting factors to agricultural production, supply the

CHAPTER SCHEME

- CHAPTER-1- The Chapter deals with the introduction and study of the project
- CHAPTER-2- The Chapter deals with Review of literature.
- CHAPTER-3- The Chapter deals with History and Profile of the Company.
- CHAPTER-4The Chapter deals with Analysis Interpretation of data and research Methodology.
- CHAPTER-5-The Chapter deals with findings, Suggestions and conclusions.

REVIEW OF LITERATUTRE

Robert Mendelssohn, William D Nordau's, Diageo Shaw, 1994

We measure the economic impact of climate on land prices. Using cross-sectional data on climate, farmland prices, and other economic and geophysical data for almost 3,000 counties in the United States, we find that higher temperatures in all seasons except autumn reduce average farm values, while more precipitation outside of autumn increases farm values. Applying the model to a global-warming scenario shows a significantly lower estimated impact of global warming on U.S. agriculture than the traditional production-function approach and, in one case, suggests that, even without CO2 fertilization, global warming may have economic benefits for agriculture

Richard M Adams, Brian H Hurd, Stephanie Lenhart, Neil Leary,1998

Climate is the primary determinant of agricultural productivity. Concern over the potential effects of long-term climatic change on agriculture has motivated a substantial body of research over the past decade. This body of research addresses possible physical effects of climaticchange on agriculture, such as changes in crop and livestock yields, as well as the economic consequences of these potential yield changes. This paper reviews the extant literature on these physical and economic effects and interprets this research in terms of common themes or findings. Of particular interest are findings concerning the role of human adaptations in responding to climate change, possible regional impacts to Relying on both intertemporal as well as cross-country comparisons, the empirical analysis suggests that increasing development reduces climate sensitivity.ulian JC Dawson, Pete Smith2007

JM Gonzalez, A Alfonso, MJ Saenz, LM Botana,2016

OV Kyrylenko, BI Basok, Y Baseyev, IV Blinov Technical Electrodynamics 3, 52-61, 2020 Mycotoxins are secondary metabolites produced by several species of filamentous fungi. Manyof these metabolites have interesting therapeutic properties. Beauvericin isa The results of

studies of the evolution of global energy consumption are highlighted, anthropogenic and solar-terrestrial factors of influence on global warming are reviewed. Since the mid-twentieth century, the trend of increasing global surface temperature, one of the indicators of the climate system of our planet, has been investigated. An explanation of the greenhouse effect enhancement is given, as a result of an increase in the concentration of greenhouse gases in the Earth's atmosphere et al. 2009;Praveen and Sharma 2019;Van Oort and Zwart 2018). It has been empirically verified that agriculture is the primary source of income in developing countries, and people's livelihood depends on it.

Assessing the impacts of climatic and technological factors on rice production: Empirical evidence from Nepal

Aug 2021

The outcomes in Table 8 indicate that average temperature and CO 2 emissions are the most prominent factors contributing to rice production. Additionally, precipitation, seeds, and fertilizers also enhance rice productivity in the long run, as the impact of additional shocks. However, the degree of influence depends on the extent of climate change and other variables

The Carbon Footprint Of Smallholder Dairy Farming In Sub-Saharan Africa: A Review

Feb 2021

However in this manuscript, sources of CO 2 from smallholder dairy farming (SDF) were not discussed due to the fact that emissions from CO 2 are in association of cycles of carbon fixation and oxidation through photosynthesis [21] and its Direct global warming potential (GWP) is less harmful compared to

Global warming:

Since the Industrial Revolution, the global annual temperature has increased in total by a little more than 1 degree Celsius, or about 2 degrees Fahrenheit. Between 1880—the year that accurate recordkeeping began—and 1980, it rose on average by 0.07 degrees Celsius (0.13 degrees Fahrenheit) every 10 years. Since 1981, however, the rate of increase has more than doubled: For the last 40 years, we‘ve seen the global annual temperature rise by 0.18 degrees Celsius, or 0.32 degrees Fahrenheit, per decade.

The result? A planet that has never been hotter. Nine of the 10 warmest years since 1880 have occurred since 2005—and the 5 warmest years on record have all occurred since 2015. Climate change deniers have argued that there has been a ―pause‖ or a ―slowdown‖ in rising global temperatures, but

HISTORY OF GLOBAL WARMING:

Svante Arrhenius (1859-1927) was a Swedish scientist that was the first to claim in 1896 that fossil fuel combustion may eventually result in enhanced global warming. He proposed a relation between atmospheric carbon dioxide concentrations and temperature. He found that the average surface temperature of the earth is about 15ºC because of the infrared absorptioncapacity of water vapor and carbon dioxide. This is called the natural greenhouse effect. Arrhenius suggested a doubling of the CO2 concentration would lead to a 5ºC temperature rise. He and Thomas Chamberlin calculated that human activities could warm the earth by adding carbon dioxide to the atmosphere. This research was a by- product of research of whether carbon dioxide would explain the causes of the great Ice Ages. This was not actually verified until 1987.

Causes of global warming:

Global warming occurs when carbon dioxide (CO2) and other air pollutants collect in the atmosphere and absorb sunlight and solar radiation that have bounced off the earth‘s surface. Normally this radiation would escape into space, but these pollutants, which can last for years to centuries in the atmosphere, trap the heat and cause the planet to get hotter. These heat-trapping pollutants—specifically carbon dioxide, methane, nitrous oxide, water vapor, and syntheticluorinated gases—are known as greenhouse gases, and their impact is called the greenhouse effect.

Though natural cycles and fluctuations have caused the earth‘s climate to change several times over the last 800,000 years, our current era of global warming is directly attributable to human activity— specifically to our burning of fossil fuels such as coal, oil, gasoline, and natural gas, which results in the greenhouse effect. In the United States, the largest source of greenhouse gases is transportation (29 percent), followed closely by electricity production (28 percent) and industrial activity (22 percent).

Curbing dangerous climate change requires very deep cuts in emissions, as well as the use of alternatives to fossil fuels worldwide. The good news is that countries around the globe have formally committed—as part of the 2015 Paris Climate Agreement—to lower their emissions by setting new standards and crafting new policies to meet or even exceed those standards. The not- so-good news is that we‘re not working

―Climate change‖ and ―global warming‖ are often used interchangeably but have distinct meanings. Similarly, the terms "weather" and "climate" are sometimes confused, though they refer to events with broadly different spatial- and timescales.

Weather vs. Climate:

Weather refers to atmospheric conditions that occur locally over short periods of time—from minutes to hours or days. Familiar examples include rain, snow, clouds, winds, floods or thunderstorms.

Climate, on the other hand, refers to the long-term regional or even global average of temperature, humidity and rainfall patterns over seasons, years or decades.

What Is Global Warming?

This graph illustrates the change in global surface temperature relative to 1951-1980 average temperatures, with the year 2020 tying with 2016 for warmest on record .

Global warming is the long-term heating of Earth‘s climate system observed since the pre- industrial period (between 1850 and 1900) due to human activities, primarily fossil fuel burning, which increases heat-trapping greenhouse gas levels in Earth‘s atmosphere. The term is frequently used interchangeably with the term climate change, though the latter refers to both human- and naturally produced warming and the effects it has on our planet. It is most commonly measured as the average increase in Earth‘s global surface temperature.Since the pre-industrial period, human activities are estimated to have increased Earth‘s global average temperature by about 1 degree Celsius (1.8 degrees Fahrenheit), a number that is currently increasing by 0.2 degrees Celsius (0.36 degrees Fahrenheit) per decade. It is unequivocal that human influence has warmed the atmosphere, ocean, and land.

What Is Climate Change?

Climate change is a long-term change in the average weather patterns that have come to define Earth‘s local, regional and global climates. These changes have a broad range of observed effects that are synonymous with the terChanges observed in Earth‘s climate since the early 20th century are primarily driven by human activities, particularly fossil fuel burning, which increases heat-trapping greenhouse gas levels inEarth‘s atmosphere, raising Earth‘s average surface

Advantages of Global Warming?

The so-called advantages of climate are out there—if you're really looking but do they compensate for the disruption and destruction wrought by the disadvantages? Again, the answer is no but for die-hard fans of the global warming trend, advantages might include the following suspect scenarios:

- The Arctic, Antarctic, Siberia, and other frozen regions of the earth *might* experiencemore plant growth and milder climates.
- The next ice age could possibly be prevented.
- The Northwest Passage through the formerly icy Canadian Arctic Archipelago couldarguably open up to transportation.
- Fewer deaths or injuries would occur due to arctic conditions.
- Longer growing seasons could mean increased agricultural production in some areas.
- Previously untapped oil and gas reserves might become available.

Disadvantages: Ocean Warming, Extreme Weather:

For every minutely possible advantage to climate change, there is a much more profound and compelling disadvantage. Why? Since the oceans and weather are highly interconnected and the water cycle has an impact on weather patterns (think air saturation, precipitation levels, and the like), what affects the ocean affects weather. For instance:

- Changes in ocean circulation and the resulting warmer temperatures disrupt the world's normal weather patterns, bringing about more extreme weather and an increased frequency of severe and catastrophic storms, such as hurricanes and typhoons. The increase in severe storms leads to a more frequent occurrence of such things as "hundred- year floods," decimation of habitats and property, not to mention, loss of life—humanand otherwise.
- Higher sea levels lead to flooding of lowlands. Islands and coastlines are engulfed by water leading to death and disease due to flooding.

Disadvantages: Land Desertification

As weather patterns are disrupted and droughts intensify in duration and frequency, agricultural sectors are particularly hard hit. Crops and grasslands can't thrive due to lack of water. With crops unavailable, cattle, sheep, and other livestock don't get fed and die. Marginal lands are no longer useful. Farmers who find themselves unable to work the land lose their livelihoods. In addition:

- Deserts become drier, leading to increased desertification, resulting in border conflicts in already water-scarce areas.
- Decreased agricultural production leads to food shortages.
- Starvation, malnutrition, and increased deaths result from food and crop shortages.

Disadvantages: Health, Social, and Economic Impact:

In addition to climate change affecting weather patterns and food production, which in turn have a negative impact on the future of human race as well as the planet, climate change can also put the hurt on people's pocketbooks, the economy of an area on a larger scale, and health ingeneral: Disadvantages: Nature Out of Balance

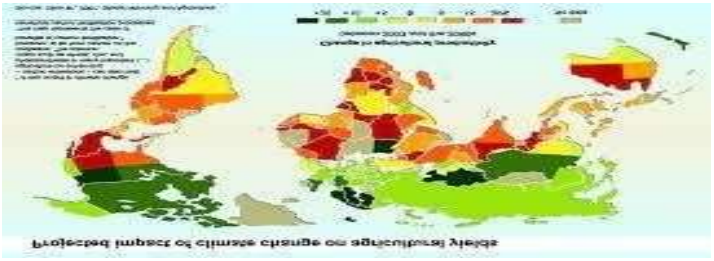
- Increase in the number of species of animals and plants heading toward extinction.
- Loss of animal and plant habitats causes animals to move into other territories, disrupting ecosystems that are already established.
- Because the behaviors of many plants, insects, and animals are dependent on temperature, a change in climate can cause an imbalance in the ecosystem itself. For example, say the availability of food for a particular insect no longer coincides with the time when the offspring of the natural predator for that insect is born. Uncontrolled by predation, the insect population booms, resulting in an overabundance of that pest. This, in turn, leads to increased stress on the foliage the insects eat, which ultimately results ina loss of food for larger animals in the food

3. Impacts of Climate Change on the Agricultural Sector

Conceptual Approach Agricultural production is carried out through the selection of crops suitable for the climate of a specific region and application of proper farming methods. Therefore, agriculture is a climatedependent bio-industry with notable regional characteristics. Regional characteristics refer to the ecosystem characteristics determined by the climate of the region. Climate change disturbs the agricultural ecosystem, resulting in the change in agricultural climatic elements such as temperature, precipitation, and sunlight, while further influencing the arable, livestock, and hydrology sectors. The flow of the impacts of climate change on the agricultural sector can be illustrated as shown in. First of all, the impacts of climate change on the arable and livestock sector are made known by biological

History of Agriculture:

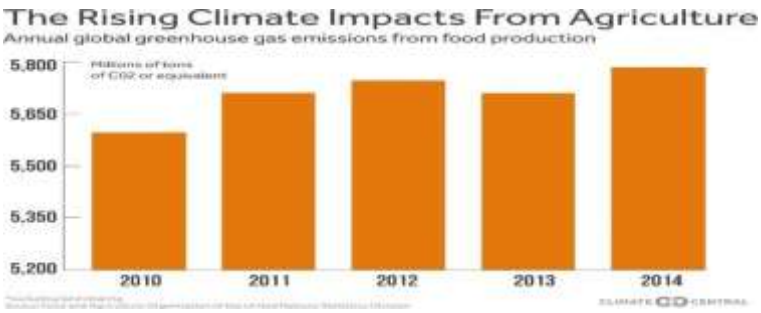
Agriculture or farming is the practice of cultivating plants and livestock. Agriculture was the key development in the rise of sedentary human civilization, whereby farming of domesticatedspecies created food surpluses that enabled people to live in cities. The history of agriculture began thousands of years ago. After gathering wild grains beginning at least 105,000 years ago, nascent farmers began to plant them around 11,500 years ago. Pigs, sheep, and cattle were domesticated over 10,000 years ago. Plants were independently cultivated in at least 11 regionsof the world. Industrial agriculture based on large- scale monoculture in the twentieth century came to dominate agricultural output, though about 2 billion people still depended on subsistence agriculture.



The Simulations Run Model of the climate scenarios (1971-2000):

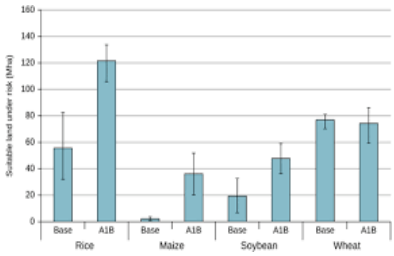
To generate the output presented here, the model was iterated three-times per simulation (i.e., 3 scenarios), a run is a set of simulations done under the same initial conditions. The annual rate ofnatural increase of the population size (ΔN) is a constant percentage. For most runs, the initial population size and growth rate were set at 45576200 and 1.7% per scenario, respectively. Population size may be sharply reduced by grain shortages (which might likely cause rapid increases in deaths by starvation). These periods of population increase are assumed to be instantaneous. Following such scenarios, the

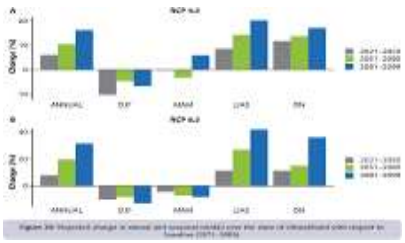
constant rate of increase is applied to the new lowerpopulation size. For most scenarios, initial production was set at 2374 metric tons (T) grain. The underlying rate of change in grain production (the ' trend ') also remains constant. For reference, the average value of the trend was 2.6 % per scenario from 1981 to 1990, and 1.4% per year from 1991 to 2000 (ANAP, 2006). To simulate normal stochastic fluctuations in production, the amount harvested in a given year is caused to deviate from the trend by one of five values (0.0,



Climate Change measurement (average rainfall) population growth and grain production:

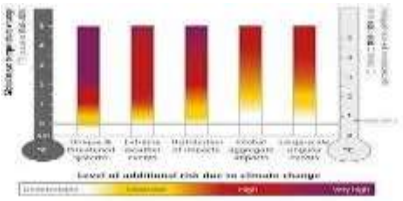
Tables 4 & 5 present the results of climate change (captured by average rainfall), population growth and food production (grain production). The climate change scenarios (1971-2000) analysis revealed that population growth during the 1st -2nd scenarios (1971-1980 & 1981-1990) increased by 58.04%, while food production during the same period increased by 68.69% (Table 4). However, in the 3rd scenario, analysis revealed a decline in food production by 76.92% as population continues to grow. This portrays an alarming situation that food production does notSource: Computer Output Results 2008 42 Effects of Global Climate Change on Nigerian Agriculture: An Empirical Analysis T.G. Apata keep pace with population growth. Average rainfall according to the study reflects a fairly steady growth during these periods. This finding corroborated with other past studies that at this period, 1981-1990; poverty levels in.





Farmer's Actual Adaptation Measures and Practises:

Table 6 presents farmers' actual adaptation measures and practices actually followed, thus, grouped into ten categories. These strategies, however, are mostly followed in combination with other strategies. These are grouped into the following adaptation options: diversifying into multiple and mixed crop-livestock systems, and switching from crops to livestock and from dry land to irrigation, practicing zero tillage, making ridges across farms and cereal/legume



Unit root test results:

The generalized Dickey-Fuller Least Squares (DF-GLS) (Elliott et al. 1992) and Phillips-Perron (Phillips and Perron 1988) root unit tests are the first stage in order to check the stationary and the inclusion of each variable. This study used both DF-GLS and PP unit root tests to ensure that none of the study variables are integrated in I(2). The results for the DF-GLS and PP unit root tests amid the variables yield of cereal (LnYC), CO2 emissions (LnCO2), average temperature (LnAT), average rainfall (LnAR), land under cereal production (LnLCP), energy consumption (LnEC), and labor force (LnLAB) are reported in Table 4. The results of both unit root tests have confirmed that variables are integrated at I(0) or I(1). According to the DF-GLS unit root test results, annual average temperature and annual average rainfall

FINDINGS, SUGGESTIONS AND CONCLUSION

FINDINGS:

1. Higher temperatures tend to reduce crop yields and favour weed and pest proliferation.
2. Climate change can have negative effects on irrigated crop yields across agro-ecologicalregions both due to temperature rise and changes in ater availability.
3. Rainfed agriculture will be primarily impacted due to rainfall variability and reduction innumber of rainy days.
4. Varieties and cultivars tolerant to abiotic stresses are developed under strategic research component of NICRA.
5. District Agriculture Contingency Plans have been prepared by ICAR-CRIDA, Hyderabad for 648 districts in the country to address the adverse weather conditions.

SUGGESTIONS:

1. Replacing one regular light bulb with a compact fluorescent light bulb will save 150 pounds ofcarbon dioxide a year.
2. Walk, bike, carpool or take mass transit more often. You'll save one pound of carbon dioxidefor every mile you don't drive.
3. Keeping your tires inflated properly can improve your gas mileage by more than 3 percent.Every gallon of gasoline saved keeps 20 pounds of carbon dioxide out of the atmosphere.
4. Moving your thermostat down just 2 degrees in winter and up 2 degrees in summer could saveabout 2,000 pounds of carbon dioxide a year.
5. A single tree will absorb one ton of carbon dioxide over its lifetime.

CONCLUSION:

The relationship between the adoption of agricultural diversification to mitigate the impact of climate change and its effects on the farmers‘ income was investigated. This study uses plot- level cross- sectional datasets to estimate the adoption of the impact of agricultural diversificationon households‘ farm income in the Punjab province, Pakistan. We applied the Maximum Likelihood GTE model to estimate the agricultural diversification determinants and their conditional and unconditional impact on the farmers‘ income. The Maximum Likelihood GTE model accounts for the endogenous treatment effects framework to control the endogeneity problem arising from both observed and unobserved heterogeneity and to correct selection bias issues. Results of the model show that the farmers who adopted agricultural diversification to cope with environmental variability were less benefited as compared to their untreated effort and cost. While product diversification that is compatible with the environment and more resistant to changing climatic conditions requires combating all kinds of plant pests, productivity can only be achieved by using human and production resources more efficiently

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