

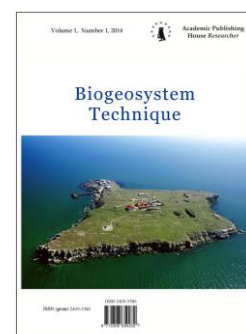
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### Effect of Greenhouse Gases on Agriculture Production in Pakistan

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#### Abstract

Change in climate is natural but slow process. Industrial revolution and anthropogenic activities have make this process fast and awarded the environment with greenhouse gases like carbon dioxide, nitrous oxide, methane etc. High temperature, melting of glaciers, heavy rain fall, flood and deforestation are result of greenhouse gases which have injurious impact on agrarian economy. Agriculture sector is considered back bone of Pakistan economy. It's not just feed the people mean while provide raw materials for agriculture based industry. This study is quantifying the impact of climate on agriculture production. Secondary data of last forty years was taken and treated in Eviews software. Regression techniques were applied and result shows that emission of greenhouse gases is effecting the agriculture production adversely.

**Keywords:** climate change; greenhouse gases; agriculture production.

## Introduction

Earth's atmospheric system is composed of different phenomenon which takes part an important role in human life. Greenhouse gases (GHG) is one of them wherein earth temperature become raised due to existence of certain gases in environment [1]. Greenhouse gases variant meteorological conditions like high temperature, rainfall and airstream are naturally exist in a particular region constitute climate, called climate change and have adverse effect on human lives especially on those who depends on agrarian production [2]. GHG are also the end result of anthropogenic activities, (excess use of fossils fuel, deforestation and Industrial revolution etc.) has increase concentration of GHG from 280ppm to 380ppm [3]. It's actually the cluster of carbon dioxide, methane, and nitrous oxide from which CO<sub>2</sub> is most injurious for environmental change than of other [4]. Agriculture sector, the main victim of this change has created doubt of food insecurity Fact is that climate is major predictor of crop production and hasn't choice except to rely on environmental condition for agriculture growth [5].

Agriculture is an older economic activity and partakes a crucial role in economic development particularly in those countries who have agriculture based economy [6]. Specifically in Pakistan 21 % of GDP comes from agriculture sector and provide employments opportunity to 45 % people living in rural areas [7]. Last few years Pakistan is also suffered with heavy precipitation and flood which is one of the GHG's blessing. The total damage calculated is 18403 million US dollars, from which 89 % was direct and 11 % was indirect damage to farming community [7]. Energy demand is increased with increasing rate of population. Excessive use of (fossils oil, and gaseous) fuels generate CO<sub>2</sub>, NO<sub>2</sub>, NH<sub>4</sub> and other greenhouse gases which affect Ozone (O<sub>3</sub>) layer. Industrialization and their wastage also are primary source of CO<sub>2</sub> emission, polluted air and water [8]. The polluted water again reach in meadow through water irrigation system enhance certain nutrients in land also reduced crop production and soil also. Air pollution generates different skin and breathing related diseases' and especially allergies for those people living in industrial areas. Hence it proves that climate change has direct and indirect impact on agriculture production which has direct impact on human economic lives. Numerous researches has been done to find effect of climate on agricultural production but still it is a rising issue that need to be redress with the help of research [2,4,5]. Objective of the study is to investigate effect of greenhouse gases CO<sub>2</sub> on agriculture production. This study will be carried out quantitatively. First section will raise problem consequently supported with literature. Second section will comprises of previous researcher's finding on this issue. In third section methodology will be discussed. Forth section will describe the research finding and conclusion. Future research direction and recommendation will be given at the end.

## Literature review

Climate change has become a global environmental and economic challenge. Plantation and crop production, are affected by various atmospheric condition, such as high temperature, humidity, rainwater could work as synergistically and destructively with other yield determiner's factors. [9] conducted study in Latin and North America, to look into the effect of physical impact of environmental change on agriculture, in sense of change in crop productivity, livestock yield and effect of the yield alternation on economy. Findings reveal that farmers adaptation of technical skills and knowledge is pivotal to enhance the crop production and price. This study did not highlight the antecedent of climate change and sources of emission of greenhouse gases which is actually requirement of this era to cope up with climate change [5][10][11]. [12] highlighted that energy, industrial sector, use of land, waste and agriculture sector are the main sources of direct (CO<sub>2</sub>, NH<sub>4</sub> and NO<sub>2</sub>) and indirect (carbon mono oxide, oxide of nitrogen and volatile of methane) emission of GHG in Pakistan. High Consumption of energy in commercial areas support industry meanwhile producing the environmental problem as well which effect human health. As confirmed by [13] that polluted water is outcome of industrial wastage infected the human health badly. The improper handling of polluted water, generate carbon dioxide and methane and have venomous effect on climate, human health, agriculture and economy [14][15]. Purpose of the study was to investigate effect of GHG consequences on agriculture sector of Pakistan. Result shows that minimum temperature has negative relation with Rabi and maximum temperature has positive relation with kharief crop production. In this study only effect of climate change on agriculture and blessing of agriculture sector was discussed. It neglects to expose the dark side of agriculture sector

that is agriculture sector which is itself a big source of CO<sub>2</sub> emission. As [16] proved in research that agriculture land, use of biomass energy and forest areas are the major source of carbon emission and have negative relation with carbon emission. [5] carried out the research in Taiwan to explore the relation of climate change on agriculture production. Empirical findings show that climate change as positive is effect the agrarian production and greenhouse gases are reason of climate change that need to be stop or shut down by appreciating the forestation. [17] conducted the study in Pakistan to find the linkage between CO<sub>2</sub> emission and agriculture sector. Finding shows that increasing rate of carbon dioxide emission could leave drastic results on economy and agriculture productivity because CO<sub>2</sub> has negative relation with agriculture production. Use of fossil fuel, mistreatment of industrial wastage, deforestation are root cause greenhouse gases and infected human life, agriculture production and export of agrarian food [4], [6], [18].

### Objective of Study

The specific objective of the study is to;

Find the relationship among emission of greenhouse gas CO<sub>2</sub> on agriculture production of Pakistan.

### Methodology:

This study is carried out quantitatively. Agriculture sector of Pakistan is chosen as population. Sample size is data of last fifty year. Data is collected from secondary sources. Agriculture production data is taken from website of state bank of Pakistan and carbon dioxide emission data is taken from website of world development indicator. It was analyzed in Eviews. Simple regression is run.

### Findings

<b>Dependent Variable: Crop production</b>	
<b>Independent Variable: CO<sub>2</sub> Emission</b>	
<b>Sample: 50</b>	
<b>Range: 1960-2009</b>	
<b>Variable</b>	
Constant	4304.941
CO <sub>2</sub> Emission	2053.527
Probability	0.0000
R-squared	.509411
F-Statistic	49.841
Probability	0.000
Durbin Watson	1.51

P value is less than 0.01(p<0.01)

Value of Durbin Watson test is 1.52 provide evidence that there is positive auto correlation exist in data. F value is 49.84 and p value is 0.000 (p<0.01) which is significant. R square shows the goodness of fit of the model. R square value is 50.94 % which means that if 1 % change will occur in emission of carbon dioxide it will bring 50.94 % change in agriculture production. value of regression coefficient is also significant at 0.000 level which is less than p value. It means as the emission of carbon dioxide will increase the agriculture production will decreased. High rate of CO<sub>2</sub> emission have positive relation with low rate of agriculture production.

### Conclusion

This study is done quantitatively to find impact of greenhouse gas CO<sub>2</sub> on agriculture production. Result proves that rising rate of CO<sub>2</sub> emission has great impact on agriculture production. In Pakistan agriculture sector consider as backbone of Pakistani economy. Climatic change which is results of carbon dioxide, methane and nitrous oxide released from uses of oil, gaseous and fossils fuels. There is need to discourage deforestation at governmental, developed

some policies for dumping of industrial wastage and ensured implementation of these policies. Major problem is lack of awareness about global warming especially in developing countries where people are have no idea about greenhouse gases and its impact on environment.

### Limitations

This research is done quantitatively. In future qualitative techniques could be used. Only impact of CO<sub>2</sub> emission on agriculture production is checked. For future perspective combine effect of three gases (CO<sub>2</sub>, NH<sub>4</sub> and NO<sub>2</sub>) on agriculture sector must be explored. Awareness of greenhouse gases effect need to explore.

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