

# Effect of Climate Change on Rice Productivity in Imphal West District of Manipur

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**Abstract**—Climate change and agricultural sector are inseparable. Apart from other causes of changing environmental climate, crop production has also played its role in climate change which in turn has both positive and negative effects. The paper focuses on the interrelationship between crop production and climate change in general and effect of Climate Change on Productivity of Rice Cultivation in Imphal West district of Manipur. Increased population increases demand for food which has to be met through increased production/or productivity. Increase production of rice crop and residues of the crop increases emission of the greenhouse gas methane (CH<sub>4</sub>). Linear trend analysis have revealed that there exists variations in selected climatic factors viz., rainfall, temperature, relative humidity and sunshine during the study period 1999-2000 to 2013-14. Spearman's correlation method has revealed that there exists positive correlation between selected climatic factors and productivity of rice in the region. Sunshine and rainfall have the strongest correlation with rice productivity with  $r= 0.44$  and  $0.37$  respectively and co-efficient of determination has revealed that highest variation in rice productivity was due to sunshine hour (19 %). In order to determine the effect of selected climatic factors and fertilizer consumption on productivity of rice, multiple regression analysis was adopted. The analysis revealed that beta co-efficient of rainfall, temperature, relative humidity and fertilizers were found to be significant at 5 per cent level of probability and sunshine hour was found to be significant at 1 per cent level of probability. Co-efficient of multiple determinations ( $R^2$ ) was found to be 82 per cent, which means that 82 per cent of the variation in rice productivity in Imphal West district of Manipur was explained by the effects of the selected factors.

**Keywords:** Climate change, Productivity, Linear trend, Spearman's correlation, Multiple regression.

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