

IMPACT OF CLIMATE CHANGE ON AGRICULTURAL PRODUCTION: CASE OF KAVRE AND JUMLA DISTRICT



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I, **Keerti Singh Pandey** hereby declare that the dissertation work entitled “**Impact of climate change on agricultural production: Case of Kavre and Jumla district**” presented herein is my **own** work, done originally by me and has not been submitted or published elsewhere and all sources of information used are duly acknowledged. Errors, if any, are the responsibility of my own.

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ABSTRACT

Nepalese economy depends heavily on agriculture. Agricultural sector alone contributes about 42% of the total GDP. Climate change is a global phenomenon which has affected crop and livestock production practices and their yields. Negative effects are projected to be more prominent than the positive effects. In a humid climate like that of Nepal, there will be changes in spatial and temporal distribution of temperature and precipitation due to climate change, which in turn will increase both the intensity and frequency of external events like droughts and floods. In this regard, an attempt has been made to investigate the effect of climate variability on the rice, wheat and maize yield in transplant/planting, maturity and harvest periods along Kavre and Jumla district of Nepal. The climate variables such as temperature, rainfall are utilized to explore the relation of climate to the crops yield based on 20 years of data records. The study focuses on the variability of rainfall and temperature in Kavre and Jumla district in various cropping periods of rice, wheat and maize yield. The (linear) regression analysis is carried out to study the climatic trend. The correlation analysis is carried out between the backward difference filtered climatic parameters and the backward difference filtered crops yield.

There has been 0.02⁰C per annum increase in temperature of Kavre district and 0.064⁰C per annum of Jumla district. The average annual rainfall of the Kavre has been 1144.9mm and 797.8mm of Jumla district. The impact is assessed for each cropping periods of respective crop. Yield of rice, wheat and maize is in growing trend, but fluctuates over the years. The correlation between rice yield and temperature and rice yield and rainfall in harvest period is negative at Kavre district but positive at Jumla district which shows positive response of climate change. Similarly, the correlation wheat yield and rainfall and minimum temperature in harvest period is positive whereas wheat yield and maximum temperature is negative at Kavre district. The correlation between wheat yield and rainfall and maximum temperature is positive but yield and minimum is negative at Jumla district. Likewise, the correlation between maize yield and temperature is positive but yield and rainfall is negative at Kavre district. While that of correlation between maize yield and rainfall and temperature is negative at Jumla district which shows climatic condition is favorable for maize production. The result has shown that extreme fluctuation in weather has caused negative impact on production in Jumla than that of Kavre district.

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LIST OF ABBREVIATION

%	Percentage
AFDB	African Development Bank
APT	Actual Evapotranspiration
CBS	Central Bureau of Statistics
Co ₂	Carbon Dioxide
Corr.	Correlation
CV	Coefficient of Variation
DHM	Department of Hydrology and Meteorology
FAO	Food and Agriculture Organization
ha	Hectares
ICIMOD	International Center for Integrated Mountain Development
IPCC	Inter Governmental Panel on Climate Change
Km	Kilometer
m	Meter
mm	Millimeter
⁰ C	Degree Celsius
PET	Potential Evapotranspiration
ppm	Parts per million
SD	Standard Deviation
UNDP	United Nation Development Project
UNEP	United Nations Environment Program
WMO	World Meteorological Organization