

Climate Change and Its Impact on Agriculture Productivity of Nuwakot District

Master of Science Dissertation

Submitted by:

Sangita Subedi

Exam Roll No: 596

T.U Regd. No: 5-2-33-677-2003

Submitted to:

Central Department of Environmental Science

Tribhuvan University

Kritipur, Nepal

A dissertation submitted to the Central Department of Environmental Science

Institute of Science and Technology

(For the Partial Fulfillment of Master's degree in Environmental Science)

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LETTER OF RECOMMENDATION

This is to certify that **Ms. Sangita Subedi** has prepared this dissertation entitled “**Climate Change and its Impact on Agriculture Productivity of Nuwakot District**” under our supervision and guidance. This dissertation work reflects her original work and fulfills the requirements for the completion of Master of Science Degree in Environmental Science.

We therefore, recommend this dissertation for approval and acceptance.

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LETTER OF APPROVAL

This dissertation presented by **Ms. Sangita Subedi** entitled “ Climate Change and its Impact on Agriculture Productivity of Nuwakot District” has been accepted as a partial fulfillment of the requirements for the completion of Master of Science Degree in Environmental Science.

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DECLARATION

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I, **Sangita Subedi** hereby declare that the dissertation work entitled “ **Climate Change and Its Impact on Agriculture Productivity of Nuwakot District**” presented here in 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

Agriculture is very much sensitive towards climatic variability. Changes in climatic factors like temperature, solar radiation and precipitation have potentials to influence crop production. Nepalese economy depends largely on agriculture which contributes 42% of the total GDP. In this regard an attempt has been made to investigate the effect of climatic variability on the paddy, wheat and maize yield in plantation maturity and harvest period in Nuwakot district. The climate variables analyzed in this study are temperature, and rainfall. These two variables are used to explore the relation of climate to the paddy, wheat and maize yield based on 20 years of data records from 1990 to 2009. The regression analysis was carried out to study the climatic trend also the correlation analysis is carried out between the backward difference filtered climatic parameters and the backward difference filtered crop yield.

Over the last 20 years the mean temperature increased by 0.051°C per year. There has been 0.06°C per annum increase in maximum temperature and 0.006°C per annum increase in minimum temperature.. The warmest year was 2009 with the mean maximum temperature of 29.19°C .Regarding the rainfall, total mean annual rainfall was of 1922.7 mm with mean annual rainfall of 155.72 mm in the district. The year 2002 remained the wettest year with total mean annual rainfall of 2285.6 mm and the year 2006 was the driest year over the study period with total annual rainfall of 1254.4mm.

The present study concludes that increase in temperature and increase in rainfall is favorable condition for paddy yield .In case of wheat increase in temperature and rainfall is favorable in plantation period only, the condition is reverse in maturity and harvest period. However in case of maize decrease in temperature and increase in rainfall is favorable for both plantation and harvest period.

The impact of irrigation in crop yield has not been considered in this study. Furthermore, the complex relationship between crop and climate should be studied in detail taking into account of the multiple relations between various meteorological variables.

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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
°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