

**ANALYSIS OF DROUGHT EVENTS AND ITS
COMPARISON WITH CEREAL CROPS YIELD
AT KARNALI BASIN**



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Submitted by

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RECOMMENDATION

This dissertation entitled “**Analysis And Comparison of Drought Events With Cereal Crops Yield At Karnali Basin**” submitted by Mr. **Bickky Karki** has been approved as a partial fulfillment for the M.Sc. in Meteorology.

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DECLARATION

I, Bickky Karki, hereby declare that the work presented in this dissertation is a genuine work done originally by me and has not been submitted elsewhere for the award of any degree. All sources of information have been specifically acknowledged by reference to the author(s) or institution(s).

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12/3/2015

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ABSTRACT

Nepal's fragile geology and steep topography makes it one of the most disaster prone countries in world. Floods, landslides, earthquakes, GLOFs (glacial lake outburst floods) and droughts are the most common natural hazards. In recent years, due to the climate related disasters like drought has resulted in higher food insecurity in the most vulnerable communities, particularly in Western Nepal. Karnali is one of the most affected drought region of Nepal and also the study of drought is limited in Nepal hence the study is made on this topic at Karnali basin.

For the study, simple and flexible tool was used named SPI on the basis of precipitation as the only input parameter around the basin. The study mainly focuses the meteorological and agricultural drought so the drought analysis was done with the time scale of 3 months (June, July and August) or SPI-3 for a period of 34 years (1980 to 2013). There were total thirteen stations made final after eliminating other stations due to data unavailability for the study at the basin.

Based on the study, all the stations were recorded by normal drought (extremely, very, moderately wet and near normal are merged as normal) event and then moderate type were found in most of the stations for same or different years. And lastly severe and extreme were recorded after the previous two types. Similarly the result also shows that the number of drought events is highest in the month of June during the 7 years of time interval i.e. from 1987-2013 with 22 droughts in total. And finally the drought events were compared with different cereal crops yield such as paddy, maize and millet from 1999 to 2011. The result shows that all the crops yield were not in decreasing phase, it was in increasing trend rather apart from two or three years throughout the period of eleven years used for comparison. It was quite unknowing that the yields were not affected more by drought in this part of area from 1999 to 2011, the reason may be the use of more chemical fertilizers for quick production by the farmers and also the development of canals for irrigation purpose that made the crops good enough for the increment of yield.

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ABBREVIATIONS

CBS	Central Bureau Of Statistics
CDHM	Central Department Of Hydrology and Meteorology
DHM	Department Of Hydrology and Meteorology
DJAF	December January February
FAO	Food And Agriculture Organization
GLOF	Glacier Lake Outburst Flood
ha	Hectare
HPI	Human Poverty Index
IPCC	Inter Governmental Panel on Climate Change
ITCZ	Inter Tropical Convergence Zone
JJAS	June July August September
MAM	March April May
masl	metres above sea level
MT	Metric Ton
MoAD	Ministry of Agricultural Development
NekSAP	Nepal Khadhya Surakshya Anugaman Pranali
ON	October November
PDSI	Palmer Drought Severity Index
SPI	Standardized Precipitation Index
sq. km	Square Kilometer
TU	Tribhuvan University
UN	United Nation
USDA	United States Department Of Agriculture