

**Climatic Trends, Farmers' Perception on Climate Change and its
Impact on Agro-ecosystem Services in Organic and
Conventional Tomato Farms in Salyan, Nepal**



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RECOMMENDATION

This is to certify that **Ms. Anita Khadka** has completed this dissertation work entitled "**Climatic Trends, Farmers' Perception on Climate Change and its Impact on Agro-ecosystem Services in Organic and Conventional Tomato Farms in Salyan, Nepal**" as a partial fulfillment of M.Sc. degree in Botany under our supervision. To the best of our knowledge, this is her original research work and has been submitted for any other degree in any institutions.

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ABSTRACT

Climate change is the change in climatic pattern as temperature, rainfall etc. The uncertainties driven by the climate change impact on the agriculture is globally questioning the food security. Better understanding of processes that shape farmer's adaptation to climate change is crucial for identifying vulnerable entities and to develop targeted policies. However, in this study, focus discussion and household survey was conducted to investigate the farmers' experiences on climate change. Sixty households were selected randomly from Phalabang VDC of Salyan district. Validated structured questionnaires were used to elicit information from respondents. Data were analyzed using both descriptive and inferential statistics. Farmers were fully aware of the climate change, effect of climate change and possible coping strategies. The respondents claimed increased temperature and decreased rainfall which was verified by meteorological data. The risks associated with these changes are real but highly uncertain. Such varied climatic changes induced decreased soil fertility, invasion of weeds, diseases epidemics and poor livestock health as perceived by the respondents of the study area. Thus, most of the farmers perceived the use of chemical fertilizers and pesticides, hybrid/ improved seeds, change in crop patterns and agricultural diversification as adaptation to the changing climatic patterns which has degraded the environmental forms. In upland of the study area, maize–wheat pattern has become adapted instead of maize–millet pattern in around the homestead areas (Bari) whereas low land farms are following the similar pattern as before. While some of the framers in the study area are still following the traditional farming under the changed climatic conditions. They claimed traditional farming method as environmental friendly despite of low production. Thus, we concluded that there are two adoptational strategies against the climatic stresses as followed by the farmers of the study area.

In this study, comparison between organic and conventional farms based on different parameters was done. Two organically and four conventionally managed tomato fields from the study area were evaluated for soil microorganisms, soil carbon, soil pH, weed species richness and crop yield. Soil sampled from five plot of 1m² from each fields were used for carbon, pH and microbial analysis. And the tomato yield was calculated. The result shows that organic farms have higher soil pH, soil organic carbon, bacterial colonies and weed species richness than that of the conventional farms. This shows that compared to conventional farms, organic farming

practices have advantage over improving the soil quality. Despite of all those features, organic farms have low tomato fruits production as compared to the conventional farms. Thus, it is concluded that the main challenge in organic farming is to increase the yield and in conventional farming the challenges are to improve the soil quality and enhance and protect the above and below ground diversity. And most of the studies that compared the biodiversity between organic and conventional farms revealed the lower environmental impacts from the organic farms than the conventional ones. Thus, the present study reveals that to minimize the environmental impacts, the farmers in the study area should be ensured to follow the traditional farming systems rather than the environmental degrading conventional farming system under the changing climatic conditions.

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LIST OF ABBREVIATION AND ACRONYMS

GHGs:	Green House Gases
IPCC:	Intergovernmental Panel on Climate Change
ADS:	Agriculture Development Strategy
CBS:	Central Bureau of Statistics
GDP:	Gross Domestic Product
FAO:	Food and Agriculture Development
DHM:	Department of Hydrology and Meteorology
PAN:	Practical Action Nepal
UNFCCC:	United Nations Framework Convention on Climate Change
MoPE:	Ministry of Population and Environment
VDC:	Village Development Committee
DDC:	District Development Committee
PDA:	Potato Dextrose Agar
masl:	Meter above sea level
%:	Percentage
Mt/ha:	Metric ton per hectare