

## **Preface to the Special Issue on “Agriculture, Livelihood Systems and Climate Variability”**

Sustainable development has been a focal issue in the discourse of development, more so after the Rio Declaration, especially in the context of developing countries. Many of them are facing the double dilemma of resource scarcity and the majority of their population living under poverty and hunger. Among them, least and less developed countries are the ones where many people are in abject poverty. They are hardly able to spend a dollar a day for their livelihoods and have almost no viable resource to tackle the problems they face. The fragile conditions of these countries marginalize them, and their people, who then become vulnerable with almost no capacity to observe shocks that (may) befall upon them.

As climate change becomes stressors impacting the production and livelihood systems around the world, it is perceived and established that the climate variability is a phenomenon considered to be due to the global warming caused by ever increasing green house gases (GHGs) emissions. Agriculture, inclusive of crop, livestock, forestry and fishery productions and rural communities, more so in developing countries, are more vulnerable to such stressors, due to their exposure and extensive dependence on climate sensitive options of production and livelihood systems, and limited adaptive capacities. This in turn often adversely affects their production and livelihood strategies.

On the other hand, the high input high yield agriculture, pursued vigorously to secure the much needed food to fight malnutrition and hunger around the world, is also regarded as one of the sectors emitting a big share of GHGs in the world. Thus, the agriculture sector seems to be heading towards vicious circle of making it more vulnerable to climate variability by its own current production system. Hence, it is very essential to reconsider such production system and devise out the production and management system that not only checks the emissions of GHGs, but also produces enough food to fight malnutrition and hunger around the world efficiently. This devise would ensure the sustainable management of the natural resources, enhance the adaptive capacities of the rural communities, eventually make them more resilient to the vulnerability context, and create a rural livelihood system with better welfare.

In order to deal with these issues, different aspects of agriculture, livelihood systems and climate variability will be discussed in this special issue of the *Journal of International Development and Cooperation* with the objective of adopting interdisciplinary perspectives to identify problems and formulate strategic solutions, to achieve environmental sustainability, and design a low carbon society maintaining people's quality of life without harming the ecosystem.

After a rigorous review of the manuscripts submitted, eight refereed papers viz., three reviews, four articles and a research note are accommodated in this issue with due consideration of the objective.

Of the three reviews, the first one discusses on organic farming practices which are spreading gradually all over the world, from the global and local perspectives. It considers the issues of food security, food availability, accessibility and stability, environmental health, local utilization of food and extension services. The second one discusses the soil conservation practices for sustainability of rice-wheat cropping system in Nepal. It focuses on the potential of soil conservation practices through supplementation of organic matter and zero-tillage farming to check the decline of crop productivity and mitigate GHGs emission. The third one makes a discussion to understand the relationship between climate change and poverty in Nepal, which produces very little GHGs, but is more vulnerable to climate change due to its fragile biophysical and socioeconomic conditions.

Of the four articles, the first two articles empirically discuss the issues of climate change and socioeconomic conditions. The

former discusses the relationship between climate variables and yield of food crops in Nepal by controlling the nonclimatic variables. By doing so it assesses the effects of recent trends of climate variables; temperature and precipitation, on the yield of major food crops, using the district level data for 30 years from 1978. It concludes that the climate variables suppress the yield of the crops in different ways according to the nature of the crop, and paddy, maize and millet are not able to overcome such suppressions. The later discusses the comparison of adaptive capacity and adaptation practices in response to climate change and extremes among the Chepangs; one of the highly marginalized indigenous nationalities dwelling in the mid-hills of Nepal. It is argued here that the balanced possession of various assets, determining the adaptive capacity of the households is necessary to translate the capacity into adaptation actions to secure their livelihood.

The third article discusses the spatial and temporal dynamics of flora in forest, grassland and common land ecosystems in relation to flood, a natural phenomenon and human activities in Chitwan, the southern plains in Nepal. It clarifies the reciprocal relation of population and environment. The fourth article discusses the carbon intensive urbanization, climate variability and urban vulnerabilities in hill areas, with evidences from Gangtok urban region, Sikkim, India. It suggests the coping strategies at local and state levels for the effective management of the vulnerabilities.

The research note dwells on the promotion of rural livelihoods through riverbed vegetable farming to generate the income for vulnerable poors in the context of climate change, in the *tarai* regions (southern plains) of Nepal. It concludes that this farming is pro poor and environment friendly.

The contents of this volume are mostly of the evidences from southern parts of the Himalayas; Nepal and Sikkim, but the issues addressed are not confined to the region. The research output can be applicable to similar pertinent issues elsewhere, especially the biophysically and socioeconomically vulnerable countries/ regions, i.e., developing countries, montane regions, landlocked areas and so on.

Special Issue Editorial Board Chair, MAHARJAN Keshav Lall  
Professor, Graduate School for International Development and Cooperation  
Hiroshima University