Ecosystems changes and implications on livelihoods of rural communities in Africa

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Sustainable use of natural resources is an important aspect of ecosystems management. Sustainable management requires the maintenance of biodiversity and other vital ecosystem functions and processes, including provision of a myriad of ecological goods and services, such as cycling of nutrients and water. Resource management also needs social mechanisms that receive, interpret and process feedback signals from the ecosystems in adaptive ways. To ensure sustainable ecosystem management, it is important to have current state of knowledge related to ecosystem services so as to facilitate a critical evaluation of the consequences of ecosystem changes on human well-being and risks that could be associated with unsustainable ecosystem management.

Many ecosystems, particularly in Africa, have undergone tremendous changes, associated with a number of drivers of bio-physical and socio-economic nature. The bio-physical drivers can be associated with global change or changes in the landscapes due to geomorphic processes, which can be triggered by, among others, tectonics forces. Socio-economic drivers are factors that enhance some of the bio-physical processes such as vegetation degradation, soil erosion and overexploitation of resources. Among the socio-economic drivers are microeconomic policy changes and rapid increase in population leading to increased demand on basic needs for subsistence, which in many African countries depend on natural resources.

Understanding the social driving forces and impacts on ecosystems has emerged as a major objective of the science of global environmental change. As a result, a human dimension of global change agenda has emerged, encompassing a concern for understanding dynamics of ecosystems changes, for example, aspects like land-use and land-cover changes, within regional settings and the impact on economic, social-political development, demographic and environmental management.

In most African countries, the livelihoods of rural communities are largely dependent on agriculture (crops and livestock). Sustainable livelihoods of these communities therefore

depend on proper management of agro-ecosystems as well as other natural ecosystems. Agro-ecosystems are based on the premise that natural ecosystems are models for the long-term management of agriculture, and on the philosophy of working with nature rather than against it. It has become increasingly clear that sustainable agriculture, for example, cannot be attained by viewing agricultural systems as independent from other landscape elements or ecological systems. Thus a landscape approach must be established in which landscape units, such as forests, watersheds, wetlands and agro-ecosystems are managed as functional systems based on the concepts of holistic and long-term sustainability.

The international conference on 'Ecosystems Changes and Implications on Livelihoods of Rural Communities in Africa', from which this special volume is based, was organized at a time when the impact of ecosystems changes are becoming vivid, not only globally but also more importantly at a national and community levels. The high dependence for the livelihoods of many African communities on ecosystems means that any changes in the ecosystems may have considerable impact on the livelihoods and general welfare of its people.

Studies have been carried out in various parts of Africa to establish the degree of ecosystems changes both spatially and temporally and the associated factors of change. The conference was organized to share information and experiences from such studies around the theme of ecosystems changes. The conference aimed at establishing the state of the art on the theme and drawing up policy issues and implication of ecosystems changes to the livelihoods of rural communities in Africa.

The conference addressed three main themes; Landscape dynamics, that dealt with land use/cover dynamics and drivers of change in the tropics, impact of climate change on ecosystems, and implications of landscape change on ecosystems and loss of biodiversity; Ecosystems dynamics and implications on livelihoods, that dealt with land use/cover change and rural livelihoods, poverty-environment linkages; and Socio-political aspects of ecosystems management, that dealt with political ecology of landscape change, role of policies on landscapes and ecosystems management, as well as resources access and tenure regimes and their implications on landscapes. This special volume is organized in the same way.

Generally, papers presented along the aforementioned themes establish the linkages and interactions between ecosystems and livelihoods of rural communities and draw up policy recommendations for enhancing these linkages and interactions, while ensuring sustainable management of the ecosystems. Efforts have been made towards identification of ways in which rural communities can be helped to cope and adapt to current and possible future changes in the ecosystems to ensure sustainable livelihoods.

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