

# THE GLOBAL ECONOMIC CRISIS AND SUSTAINABLE RENEWABLE NATURAL RESOURCES MANAGEMENT

Proceedings of the 33rd Annual Conference  
of the Forestry Association of Nigeria  
held in Benin City, Edo State, Nigeria.

25th - 29th October, 2010

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## **ROLE OF TRADITIONAL INSTITUTIONS IN CONSERVATION OF PLANT DIVERSITY**

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### **Abstract**

Plant diversity is the vast variety of plant life and its ecological complexities existing in any region. Circumstances gave rise to diverse experiences among indigenous societies about plant wealth around them. Plants are integral for the survival of the traditional culture. Each community has a unique set of social institutions. Conservation efforts can be more efficient if it is based on deep knowledge of social institutions. Plant diversity conservation thrive if synchronizes with improvement in human welfare. It is imperative that plant diversity conservation and its sustainability should focus traditional institutions because of its voluntary compliance features and cost effectiveness. This review focuses on critical factors in traditional institution that can affect conservation of plant diversity. These factors include local attitude, land use change, indigenous knowledge, religious belief, and cultural traditions.

### **Introduction**

The Convention on Biological Diversity (CBD) was opened for signature on June 5, 1992 so as to regulate the continuing loss of the flora and fauna of our planet, at the U.N. Earth Summit in Rio Janeiro, Brazil (<http://www.biodiv.org>) (July 27, 2009). The long-term objective of the Global Strategy for Plant Conservation is to stop the continuing loss of plant diversity. In simple terms, plant diversity is the vast variety of plant life and its ecological complexities existing in any region. Conservation success is measured through the prevention of species extinction (Orlove and Brush, 1996). Conservation policy focuses its efforts on three levels. The first targets individual species, especially the protection of subspecies, to reduce the risk of species extinction. The second focuses on the protection of the habitat in which the populations of endangered species live. The third manages entire assemblies of ecosystems (Orlove and Brush, 1996).

Protected areas, reserves and parks are land management strategy for conserving biological diversity. Research in conserving land outside protected areas is growing (Szaro and Johnston, 1996) and has attracted interest because CBD's objective of 10% of national territories will not be enough to conserve most biodiversity (Soule and Sanjayan, 1998). Institutions are defined as the rules and norms which structure human interaction, including their enforcement characteristics and sanctioning mechanisms (North, 1994). Institutions include any form of shared constraint that human beings devise to shape their daily interactions and transactions. Traditional institutions are decentralised and self enforced by a community (Knight, 1992).

It may be difficult to distinguish among attitude, social and religious origins. This is because most of these factors are inseparable, especially from ecological factors. Thus, their origin is not the issue but the roles in plant diversity conservation. This review draws elements within indigenous institutions to conservation of plant diversity. The approach is that social institutions cannot be separated from broad sphere of plant diversity conservation. This begins at the local level where people and communities can evolve new institutions that will lead towards human and ecological well-being. Objective of this review is to evaluate the role of indigenous institutions in conservation of plant diversity.

### **Impact of Local Attitude**

There is a growing recognition that the effective conservation of biodiversity would depend on the long-term participation and understanding of local communities. Fiallo and Jacobson (1995) established that rural communities' attitudes towards nature conservation should be analysed as a prior condition in conservation planning. The information gathered from such analysis can be useful in choice of approaches to avoid unnecessary conflict.

However, there is a growing consensus that conservation of plant diversity requires involvement of local people and other stakeholder groups who often have different (and sometimes conflicting) value assessments of the same resource (Infield, 1988). Hill (1998) opined that attitudes of local people towards conservation may vary within a community according to gender and prior experience of individuals with biodiversity. Furthermore, Bateman and Langford (1997) concluded that non-users' value assessments of natural resources varies with the socio-economic characteristics of the respondents.

The World Wild Fund for nature (WWF) plant conservation project in Kanchenjunga region Eastern Nepal was perceived as a rural development project. Consequently, expectations are obviously high (Muller-Boker and Kollmair, 2000). However, when the restriction become obvious and many expectations with regards to improvement in living standard are not fulfilled, compliance is denied. Conversely, conservation project should not be package as solely developmental measure and its concept hardly visible to the local population.

### **Impact of Land use change**

Human land use is among the most important determinants of plant diversity (Maurer *et al.*, 2006). In recent socio-economic study comparing 140 Romanic, Germanic and Walser villages, socio-economic factors have an important influence on plant species richness via land use diversity. Villages with more difference land use types harboured more plant species numbers than expected from the species-area curve(). This indicates that land use diversity played the decisive role and that agreed with the mosaic concept

(Duelli, 1997), and the habitat diversity hypothesis (Willams, 1964), which propose higher species numbers in landscapes with higher habitat diversity.

The relationship between species diversity and landscape diversity suggests that maintaining high plant species diversity at a landscape level requires conserving high land use diversity (Maurer *et al.*, 2006). A study on land use change of United States, Maestas *et al.* (2001), revealed that plant communities on ranches, differed from those in protected area or exurban development. Thus, biodiversity differed across the three land use categories. The occurrence and density of biodiversity species were more similar between ranches and protected areas than in exurban development.

The recognition that ecological processes occur within a temporal setting and change overtime is fundamental to analyzing the effects of land use. Furthermore, each site and region has a unique set of organism and abiotic conditions, influencing and constraining ecological processes. Disturbances are important and ubiquitous ecological events whose effects may strongly influence population, community, and ecosystem dynamics. Finally, the size, shape, and spatial relationships of habitat patches on the landscape affect the structure and function of ecosystem (Dale *et al.*, 2000).

### **Impact of Indigenous knowledge**

Traditional approaches of conservation often assume that nature must be protected through the promotion of the sustainable use of the resources by local population. Over exploitation is one of the major factors of loss of biodiversity and desertification especially in dry and subhumid savanna regions. In Benin republic, rural populations rely on the use of medicinal plants for their health. Consequently, species such as *Kigelia africana*, *Azizelia africana* and *Khaya senegalensis* are becoming rare. Therefore, conservation of these species cannot be effective without the participation of local communities (Sogbohossou *et al.*, 2006). Thus, establishment of traditional botanical garden is one of plant diversity conservation strategies in Benin republic.

The new concept of traditional botanical gardens has been adopted and developed together with local communities in order to reconciled the need to conserve threatened medicinal plants and poverty alleviation (Sogbohossou *et al.*, 2006). Botanical gardens are a major force for the conservation of plants around the world (Waylen, 2006). The concept differs from classic botanical gardens which are a form of *ex situ* conservation contrary to the village botanical gardens which are a form of *circa situ* conservation (Hamilton, 2002).

*Circa situ* conservation is intermediate between the conservation *ex situ* and that *in situ*. In the case of Benin, plants are produced in nurseries to enrich spaces with original medicinal species which abundance was reduced in the past. Consequently, it is an improved and

stable form of botanical gardens because species are planted in their natural habitat. They are managed by local communities for the promotion of traditional medicine and ecotourism (Sogbohossou *et al.*, 2006). Culturally appropriate conservation can be achieved only by understanding the complexities of indigenous knowledge and principles of resources utilization (Etkin, 2002).

### **Impact of Religious Belief**

Religious belief system is the important components of culture. Ancient people have attached a religious belief or rites as part of ritual to many of the plants. Therefore, the reason for associating plant with religious belief or rites has hidden concept of conservation of plant diversity (Jasrai and Binita, 2003). Sacred groves are one of the first instances of traditional conservation (Anthwal *et al.*, 2006). Studies of sacred forests and their sacred sites throughout Africa show that religious and spiritual beliefs can sometimes be the motivation for plant diversity conservation and environmental protection (Omari, 1990; Ntiamao-Baidu, 1995). The effects of religious values on plant diversity conservation are not confined to Africa. In Northeastern India, for example, 133 species of native plants are presently found only in sacred groves, presumably having been extirpated from unprotected area (Khan *et al.*, 1997).

Traditional society of Xishuangbanna, southwest china, demonstrated the indigenous knowledge on plant conservation through establishing of holy hill forests and temple gardens (Hongmao *et al.*, 2002). Thus, gathering and cutting are strictly prohibited. Temple gardens played significant role in the *ex-situ* conservation of plant species (Hongmao *et al.*, 2002). Therefore, temple gardens could be called 'Temple-Botanical Gardens'. In Zimbabwe, the remaining dry forests in the Murarabani area are considered sacred by many local residents and are protected mainly because they provide habitat for ancestral spirits (Byer *et al.*, 2001). The plant diversity of southern peninsular, sacred groves in Kanyakumari district, India has recently been analysed. Since there is minimal exploitation of these groves, they are considered a home to certain rare, endangered, and endemic plants and are rich in biodiversity. These sacred groves are closely related to the social and cultural life of a people, which has ensured the protection of the sacred grove vegetation in its natural condition.

### **Impact of Cultural Tradition**

Byer *et al.* (2001) revealed that forest loss is less in forests that are considered sacred, or were in the past connected to sacred forests. This shows that traditional spiritual values could influence human behaviour. Thus, affect forest and play a role in protecting them. Also, plant diversity loss is higher in an area where traditional leaders are relatively disempowered by post-independence political system. Thus, strategy that links the

conservation of culture and nature is likely to be more effective in plant diversity conservation. Conversely, effects of cultural traditions on plant diversity may be dictated by effects of topography, climate and soil conditions (Rahbek, 1995; Theurillat *et al.*, 2003). Socio-economic differences among cultural traditions still play a role in shaping landscape diversity (Byer *et al.* 2001).

A recent summary estimates that there are more than 106,000 legally designated (statutory) protected areas in the world (Gaston *et al.*, 2008). There are about 5000 distinct traditional societies existing in the world (Furze *et al.*, 1996). Hotspots of high biodiversity are associated with regions where traditional societies are frequent (Posey and Dutfield, 1997). Since most of the world's biodiversity exist outside protected areas (Murphree, 1994), informal institutions may play an active role in plant conservation. Social taboos exist in most culture, both western and non-western.

North (1994) refers to social taboos as example of informal institution. In many traditional societies throughout the world, taboos frequently guide human conduct towards the natural environment. Colding and Folke (2001) suggested that designs for conservation of diversity and its sustainable use in developing countries should focus more on informal institutions, like social taboos. This is because informal institutions have been neglected in conservation designs in biodiversity rich, developing countries (Alcorn, 1995; Robbins, 1998), where park protection has been the major approach for protecting biodiversity (McNeely, 1993; Gadgil, 1998).

### Conclusion

Conservation strategies must attempt to find suitable approach so as to establish plans for conservation. The choice of approach that adequate for one species or region may not be relevant or fatal in other cases. Indigenous societies could be established to initiate people's participation in plant diversity conservation. Sacred groves village botanical gardens are refuge of valuable and threatened species. Various traditional approaches to conservation of nature require a belief system, which includes a number of prescriptions and proscriptions for restrained resources use. Thus, various indigenous practices and scientific implications could be made active and alive. In the field of plant diversity conservation, dichotomy between scientific and local tradition could be synthesized and synchronized.

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