

## **Resource Management through Indigenous Knowledge and Practices**

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### **Abstract:**

The current environmental problems that we are facing are due to the lack of effective management practices. The rural and tribal people all over the world follow certain practices for effective resource management. So the indigenous knowledge on soil, water, energy and bioresources utilization and conservation has to be recorded to safeguard the natural resources as well the biosphere. The indigenous people adopt several land management practices such as crop rotation, mulching, green manuring, organic and biofertilizers. They adopt rain water harvesting, desilting, and cleaning of water bodies, economical irrigation practices and reuse of waste water. They also use renewable energy sources such as solar energy and biomass as fuel. They conserve the plants through myths, beliefs, and domestication.

Key-Words: Bioresource, green manuring, biofertilizers, renewable energy, biomass

### **Introduction**

The society or community or habitat-based traditional knowledge on land, water, energy, wastes, and biodiversity management safeguard the natural resources as well the livelihood of those particular society or community or habitat. This is because the indigenous people have an in-depth knowledge of food, fiber, and traditional medicines. Traditional knowledge has an inevitable role in resource management (Yuan *et al.*, 2014). For example, the traditional rice cultivation system namely Hani Rice Terraces System practiced in China help people to survive through drought years with only a marginal decline in productivity (Xie *et al.*, 2012). Similarly, there are several traditional agriculture systems found all over the world. The sustainable management system of resources can be effected through this kind of globally important

agricultural heritage systems (Jiao *et al.*, 2012), biodiversity conservation, and adaption to local climate or environmental change (Victoria *et al.*, 2015).

The traditional soil management practices are focused on preserving the populations of soil biota and their activity because the agriculture productivity depends on the functions of the soil biota. The soil organisms play essential roles such as soil formation, organic matter decomposition, nutrient availability, carbon sequestration, nitrogen fixation, control of pests and pathogens, detoxification of contaminants, and enhancement of soil physic-chemical properties (FAO, 2003). Moreover, the traditional cultivation system also includes a variety of crops (polyculture) that are not only helpful in ameliorating the agricultural landscape but also secure nutritional balance in their diet.

The traditional water management practices fulfill the basic water requirements even during erratic rainfall conditions. They support the life of farmland as well farmers. The knowledge on waste management reduces the dumping load of earth and enhances soil health. Their animal rearing practices also connected with waste management, soil health, and agricultural productivity.

The traditional medicinal practices such as Siddha, Ayurveda, and Unani are interconnected with conservation and sustainable utility. The rural people in India depend on the plants of their region to cure various ailments (Venkatachalapathi *et al.*, 2015). They either obtain medicinal plants from wild or cultivate them in controlled conditions. This practice not only cures ailments but also maintains the medicinal bioresource.

Likewise, the people in the rural area involved in the conservation of plants unknowingly through cultural and religious practices. They conserve the resources through myths and beliefs. They consider certain trees as sacred and they do not disturb the vegetation in sacred groves. They even protect plants by growing them in burial sites. Their practices and festivals also depend on conservation and resource management. Although these conservation strategies are neglected in official conservation policies, they are strongly acknowledged in the literature (Kajembe *et al.*, 2003).

The traditional knowledge learning provides ideas for management of ecosystem processes and functions. These valuable ideas and strategies are restricted to particular society or community and even restricted to certain families. Many of the problems of the present scenario can be solved by following the traditional knowledge.

### **Agricultural land management practices**

Leopold (1949) stated that land management is a state of harmony between man and land. He also explained the concept of sustainable development that the initiation of human economic activity should not compromise ecological health and integrity. Agriculture production cannot be increased unless the soil health is maintained (FAO, 2011). Tribal and rural people use several healthy practices such as green manuring, mulching, and application of biofertilizers like *Azolla* in their farming system. In Nigeria and several developing countries, organic waste is used as manure (Ajibade, 2007).

The mulching practices reduce the evaporation from bare soil and mediate soil temperature, create a favourable environment for beneficial flora and fauna (Balota *et al.*, 1996), prevent soil and water contamination from pesticides and nutrient leaching and control weeds. Water logging can be solved by crop rotation. The improvement of soil property is mediated through the organic farming.

### **Water resource Management Practices**

Strauch and Almedom (2011) reported that the traditional water resources management helps people to thrive through seasonal and droughts and flooding in Tanzania. One of the better practices is desilting and cleaning the water bodies at regular intervals to sustain the holding capacity of water bodies, harvesting rain water and following economic irrigation practices namely drip irrigation, use of coir fiber to hold water for long time under the crops that require high moist soil, and using common community overhead tank as drinking water source.

### **Biodiversity Conservation**

Domestication becomes one of the important conservation practices for plants, especially medicinal plants (Hamilton, 1989). Large-scale domestication of single species *Prunus africana* in Cameroon and Madagascar conserve these species (Cunnigham *et al.*, 2002).

Social taboos exist in many cultures and they play a crucial role in conservation and management functions. In Mizoram, sacred groves are called as safety forest by the tribal group following Christianity and woodlot obtained from forest area is called supply forest (Malhotra, 1990). Gadgil and Guha (1992) reported that trees of all the species of *Ficus* are protected in many parts of the old world and now it is considered as a key stone resource.

Usually, the traditional knowledge is restricted to one group of people or elders (Dixit and Gyoal, 2011) and it may perish with them. The traditional healers know the combinations of drugs and their mode of action. Poly herbal treatment involving a range of pharmacologically active compound found more suitable than a single herb.

### **Energy Management Practices**

Research findings suggest that problems will arise when indigenous peoples are not involved or consulted in the development and implementation of energy alternatives. All over the world, the energy management practices are initiated and implemented by the native community. The Nomadic Reindeer group in arctic is using solar energy instead of non-renewable energy sources. Similarly, in Indonesia electricity is generated from water by the Dayak Pasar community. The burden on forest produces are reduced by using energy efficient stoves by an indigenous community in Mexico (Castillo and Mc Lean, 2012).

There is a variety of renewable energy sources used by local communities. Most of the solar energy in the residential building is used for heating and cooling of the living spaces, hot water production, lighting and electrical appliances at houses (Balaraset *et al.*, 2005).

### **Conclusion**

The knowledge documentation preserves our tradition, values, and heritage. It helps us to lead a peaceful, nature-bound and healthy life and it also paves the path for sustainable future.

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