



## Research article

# Incorporating permaculture and strategic management for sustainable ecological resource management



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## ABSTRACT

Utilization of natural assets to the best efficient level without changing natural balance has become a critical issue for researchers as awareness on climate change takes central position in global debate. Conventional sustainable resource management systems are based on neoclassical economic approach that ignores the nature's pattern and therefore are not actually capable of sustainable management of resources. Environmentalists are lately advocating incorporation of Permaculture as holistic approach based on ethics, equitable interaction with eco-systems to obtain sustainability. The paper integrates philosophy of permaculture with strategic management frameworks to develop a pragmatic tool for policy development. The policy design tool augments management tasks by integrating recording of natural assets, monitoring of key performance indicators and integration of sectorial policies in real time, bringing out policy as a truly live document. The tool enhances the edifice process, balancing short term viewpoints and long term development to secure renewability of natural resources.

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## 1. Need for natural resources management

Natural Resources Management (NRM) refers to the sustainable utilization of natural resources, such as land, water, air, minerals, forests, fisheries, wild flora and fauna etc. Natural Resources (NR) provide fundamental life support, in the form of both consumptive and public-good services. The ecological systems such as sustain soil efficiency, nutrient recycling, the cleaning of air and water, and climatic cycles are the fundamental factors in the management of the natural resources. It had been recognized that people and their livelihoods depend on the health and productivity of landscapes, and their actions as stewards of the land that plays a critical role in maintaining the health and productivity of the eco-system (Daly, 1990; Prell et al., 2013; Khan et al., 2014). Altogether, these resources provide the ecosystem services that underpin human life.

The natural resources are coming under increase pressure due to

rise in population and higher levels of per-capita economic activities. The estimation given by World Bank (2000) indicates that in 2030 the expected rate of the world's population is likely to be 3.7 billion. In which ninety percent of population increase will occur in developing countries. In 1990 most people lived in rural areas, but by 2030 the urban population will be twice the size of the rural population. The cities in developing countries are expected to grow by 160 percent over this period, whereas rural populations will grow by only 10 percent. The distributions of people between rural and urban areas have important implications for the types of pressure placed on the economy and environment. Changing demographics and social values bring new challenges in utilizing natural resources that are becoming competing and often conflicting (Osborn, 2013; Khan et al., 2015). Therefore, urbanization brings serious impacts on ecosystem structure and function (Horsthemke, 2009; Bety and Godfred, 2013). The role of natural resource management in national strategic planning is gaining importance and policy makers are exploring new ways to improve their planning processes (Bruyninckx, 2004; Brouckerhoff, 2008). Therefore new policy planning tools are required for the sustainability to preserve the natural resources.

In this study Permaculture is used to methodically design a

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theoretical framework for the analysis of systems development. Permaculture is based on ethics, equitable interaction with environment, a system design principles of sustainability and offers an unequivocal vision and strategy for valid sustainable management (McEwan and Goodman, 2010). Permaculture theory as a system development tool will work well with natural resources management's policy; which has benefits both as a theoretical exercise and a practical instrument (McManus, 2010). It is also an appropriate approach to use in understanding and solving of the problems involving in the arena of socio-economic development and associated environmental problems (Paull, 2011). In this context, Permaculture theory has the ability to efficiently handle the issues and challenges in designing sustainable natural resource management system. Designed framework tool based on Permaculture theory's perspective can be distinguished by providing a means for observing the patterns of human activity in terms of achieving targets, goals and purposes, facts, awareness, focus of attention and tools through analyzing natural resources data. Therefore designed sustainability assessment Policy Framework proved useful information about natural resources not only in understanding user group activities in their development of any system, but also allowed a multi-faceted analysis of the information and its users and the nature dynamics between them.

## 2. Permaculture as new approach

Mollison (2002) defined Permaculture as: a philosophy of functioning with, rather than against nature; of prolonged and solicitous observation rather than extended and inconsiderate labour; of looking at flora and fauna in all their functions, rather than care for any vicinity as a single-product system. This description of Permaculture conveys a central idea in Permaculture following and exploration of nature's pattern. The term Permaculture is an ellipsis of the words permanent, agriculture, and culture. In the beginning of 1980's, the notion of Permaculture had extended from farming systems design toward sustainable human habitats.

The Permaculture observed how natural system work and how the natural system loses its balance. There are three guiding principles on which the Permaculture paradigm is based. First, each component of the system carries out various functions. Second, each preferred function of the system is maintained by multiple components. Thirdly, everything in the system is interrelated to everything else. Every element of the system perform significant tasks such as, birds help to pest control, plants drag nitrogen out of the atmosphere and stick it into a procedure that further plants can utilize. Further, natural ecosystems reprocess their own wastes and all the various elements of a nature work collectively, such as wetlands and forests are sustainable and they fulfill their own energy requirements. It is imperative, as the weakness and productivity of a system depend not on the amount of components it restrains, but relatively how many interactions take place within the system. Therefore all the elements do their valuable work in harmony to produce a constructive living based solution on the patterns it had observed in the nature. Permaculture identifies that all living organisms have particular niches of space, time and actions. All should work within the specific niches and within these niches exist a subtle equilibrium and relation between living organisms (Akhtar et al., 2014).

Permaculture is a coherent and explicit set of design and is an ecological development system that mingles aboriginal awareness with suitable technology and supports the concept of "the Spiral of Intervention". This concept deal with the inspiration that nature should sprint its itinerary and minimum human intrusion is best course of action. It is a dynamic philosophy that expands the idea of "minimum effort, more effect". Western-industrial culture is

wedged with the approach that the more physical work and control over milieu that the worker commences; the more proficient and productive that work will be. Basically Permaculture is about producing valuable interaction between individual rudiments (Akhtar et al., 2015).

## 3. Permaculture ethics

Permaculture is a consciously planned system which imitates the pattern and interaction establish in nature and integrate sustainable management practices. It focuses; ethical and design principles that provide a framework for the Permaculture approach (Mogen, 2006; King, 2008). The ethics and principles of Permaculture are concise declaration that is global and the techniques that convey these principles will differ according to area and state (Holmgren, 2002). In the absence of any global ethical strategy concerning the environment in the modern world, Permaculture provides a convincing relationship between ethics and the well-being of the environment (Burnett, 2008; Bellacasa, 2010). The three ethical guidelines of Permaculture are as follows:

- Care for Earth
- Care for People
- Fair Share/Setting Limits to Population and Consumption.

From each of these ethics flow numerous moral functions, but the basis relics the similar. The first ethic "Care of Earth" is bound to develop and permeate all aspects of Permaculture. It focuses on provisions for all eco-systems to continue and multiply because without a healthy earth, human beings cannot flourish. Second ethic is "Care for People" means fulfilling people's essential requirements for their existence, so that people's lives can be sustained by living a good quality life without damaging the earth. The third and the last ethic "Fair Share" is the combination of the first two ethics. It recognized that human being had to share all renewable and non-renewable resources with all other living organisms and save the resources for future generations (Mollison and Slay, 1991).

There is no system to design a sustainable society without establishing the equity as others suffer without clean air, water, food, protection, significant employment etc. The vital consideration of Permaculture is to provide a fully functioning and well planned design where due to effect of overpopulation the family bear a large number of dependents, making time and energy for household fuel, fodder and food production (Smith et al., 2007; Ingwe et al., 2010). Permaculture basically discards the industrial development model of the North, which is at the core of its ethics, and seeks to design fairer, impartial systems that take into relation the limits of the natural assets and the requirements of all living organisms (Seghezze, 2009; Imran et al., 2014). The key objectives of Permaculture are environmental flexibility and vital rehabilitation which makes it suitable for over-exploited, marginal and degraded soils and water areas (James and Joshua, 2008).

## 4. Strategic management approach used in developing PMPC

Sustainable Management has various wide dimensions effects dealing with managerial, financial, legal, societal, scientific, ecological, spiritual and cultural features correlated with natural resources. The searching for equal integration of social, economic and ecological features of sustainability has been a challenge within the environmental managers and scientific community. Numerous countries are implementing land-administration reforms combined with market-based land reforms, in which communal tenure and common-property regimes may figure as importantly as

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