

Influence of Ancient Environmental Ethics on Conservation of Biodiversity in Sri Lanka: with a Special Reference to Conservation of Floristic Diversity: A Review

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Abstract: Environmental ethics, human attitudes and values that influence individual behavior and government policy towards nature, are capable of governing human actions which affect the nature. (Callicott, 1995; Jardins, 2001) Since the adequate recognition of potentially important role of environmental ethics to promote sustainable development, study on the ancient cultural assumptions, standards, and analytic techniques is significant. Sri Lanka with its rich culture and roots of ancient civilization has shown substantial evidences of application of modern sustainable environmental and resource utilization concepts and theories in ancient periods. The role played by Sri Lankan traditional environmental ethics on conserving the biodiversity in ancient times was immense. Even though the island is endowed with rich fauna and flora and ranked as the country with the highest biodiversity per unit area among Asian countries for flowering plants and vertebrates except birds (Mahindapala, 2002), traditional environmental ethics on conservation of biodiversity has been diminishing and diluting over past years. Despite accepting this vicissitude, it is essential to hand down those prevailed traditional environmental ethics to our posterity. In this study, the main objective was to provide a lucid overview of the environmental ethics on conserving biodiversity, highlighting the key religious and traditional practices of Sri Lankan communities with a special attention on conservation of floristic diversity. The study was conducted by critically reviewing the published literature on ancient environmental ethics of Sri Lanka regarding grassroots struggles to control pollution, maintaining and managing the ecosystem; restoring and recreating the ecosystem, and maintain threatened flora while preserving peoples' economic well-being. Ethics for preserving the environment should be uphold at each level of the society in general to ensure the sustainable development.

Keywords: Ethics, Biodiversity, Traditional environmental ethics

I. INTRODUCTION

Ethics are the moral principles that guide the behavior of individuals and groups of individuals. Moral principles are formed by human attitudes and values that are internalized by an individual through his/her personal realization and the socialization process. Human values are generated from a set of standards for assessing human behavior. In a society, values determine duties, obligations, norms, etc. (Jamieson, 1993). Environmental ethics are also a form of ethics which is defined as the human attitudes and values that influence individual behavior and government policy toward nature (Callicott, 1995). They influence the utilization and distribution of natural resources, by manipulating individual's attitudes and behavior, which can then lead to a societal transformation. Hence, ethical practices are closely interlinked with conservation of nature in other terms the biodiversity.

Concept of biodiversity and its conservation emerge only when the world is in a crisis of biodiversity depletion (GBS, 1992). Though these concepts were introduced to Sri Lanka in the late 1980s, the country embrace a long lived history of biodiversity conservation initiatives descending from the ancient civilization in pre-colonial era (Rathnayaka, 2002). In early Sri Lankan society, conservation of biodiversity was distinguished in every critical aspect of community such as

agriculture, religion and irrigational activities. Thus, application of traditional environmental ethics to conserve threatened biodiversity is vital. Traditional means and measures of biodiversity protection such as restriction of certain practices such as collection of germplasm, hunting in poya days and deforestation have contributed exceptionally in conservation of environment (IBCRA, 2001; Regassa Feyssa, 1999). Further, according to IBCRa (2001) saving life by saving biodiversity is directly related to the bread of every living being. Therefore, people well versed about biodiversity need support from governmental and non-governmental organizations to idolize traditional practices which promote sustainable use of resources (Prance,1991) where as effective biodiversity can only be achieved through most significantly, with the sustained effort of rural people who rely on local biodiversity for their livelihood (Hunde,2007).Conservation of biodiversity is essential in achieving enduring sustainability as Sri Lanka is still a developing country aiming at long-term development projects.

Sri Lanka’s unique and rich biodiversity comprising of high percentage of endemism is threatened at present, mostly as a consequence of historical depletion of forest cover, high and yet escalating population density, habitat degradation and unplanned development activities (MoFE, 1999). Subsequently terrestrial wild biodiversity is seriously threatened .The most acute problem has been the loss of forests through clearing for development or conversion to monoculture plantations in recent past, illegal slash and burn cultivation in the Dry Zone and encroachment for cultivation of cash crops in Wet Zone. Forest fragmentation that occurred in biologically rich Wet Zone of the country due to human settlements and plantation agriculture over several hundred years has resulted in the isolation of plant and animal populations in relatively small forest patches, restricting their natural dispersal, and consequently increasing their vulnerability to genetic erosion and local extinction. Traditional varieties of rice and other food crops which are resistant to pests, biotic and abiotic stresses under varied agro-ecological conditions have been largely replaced in farming systems by new high yielding varieties that are heavily dependent on fertilizer and pesticides (MoENR, 2002). This change has also created the loss of associated traditional knowledge developed over thousands of years. Furthermore, the natural forest cover in Sri Lanka continues to deplete over the years in an unprecedented rate creating an enormous depletion of floristic diversity. Considering these conditions the obligated traditional knowledge should be practiced again to attenuate the present loss of floristic diversity.

Conservation of diminishing floristic diversity is an integral concern of each and every biodiversity conservation project in the country. Yet, many conservation projects are incapable of fulfilling conservation goals due to direct application of modern conservation concepts originated from western countries which are unsuitable or incompatible. In this light, ancient traditional environmental ethics buried in midst of the society can play a vital role in conservation of diminishing floristic diversity of the country. Hence, this paper primarily aimed at identifying the traditional environmental ethics that prevailed to conserve the floral species and plant dominated ecosystems. Similarly the fruitfulness of traditional environmental ethics on conserving countries diminishing floristic diversity was revived and revitalized in order to transmit them for the posterity.

II. METHODOLOGY

This study was conducted by critical evaluation and analysis of available literature on ancient environmental ethical practices for conservation of floristic diversity of the country. Areas depicted in the following figure were mainly highlighted.



Figure 01: Scope of the study

III. GENERAL COMMUNITY PRACTICES ON CONSERVATION OF FOREST ECOSYSTEMS

Perspectives of ancient people on the forest and the forest landscape have nurtured local interest in conservation. Ancient people refrained from cutting large trees as they believed that large trees were inhabited by celestial beings or demons (Wickramasinghe, 2003). Since the deities held a glorified position, large trees, were not to be destroyed. Even though, this could be considered as selective protection, this custom helped in preservation of seeding plants not only in the forests but also in the villages. They even side the forest trails to secure permission to reconsidered that forests were resting-places of gods and demons. Hence, twigs were hung on branches of large trees located benter into the forests. This attitude has promoted non-exploitative and harmonious interactions. Evidence of this belief can be traced in Buddhist literature as well. The oration of Karaniyametta Sutta by Lord Buddha occurred when a group of monks were troubled by non-human groups, when meditating at the foot of secluded trees. (Weeramantry, 2009; Wickramasinghe, 2003)

Many ancient scripts indicate that in ancient times, Sri Lankan kings dedicated the fragile ecosystems such as virgin forests in higher elevations were donated to Buddhist clergy and maintained as sacred groves. Ritigala, Kalugala, Mihintale, Dimbulagala and Vedahiti Kanda are such examples which are currently protected under the Fauna and Flora Protection Act. Buddhist monasteries in these sacred groves have enhanced the sanctity while further encouraged the local social commitment towards conservation (Wickramasinghe, 2003). Ancient kings also prohibited felling of virgin forests through edicts, considering that their importance in regulating and generating rainfall (Weeramantry, 2009).

In certain situations such as the forest cover encircling the sacred mountain Sri Pada/ Adam's peak forest ecosystem was strongly interwoven with religion, history, belief systems, livelihoods and local understanding of nature. Traditional villagers living in the adjacent areas of the sacred mountain still strongly believe that the forest itself is a sacred living organism and full of spirits and divinities. According to the ancient tradition, no-one is permitted to climb this sacred mountain during the off-season, between May and December. Violating the rules on climbing the mountain is generally accepted as a severe offence. Also it was common among the pilgrims and peripheral dwellers to make vows meant to secure them access and use of the forest's resources, as a means to plead for generosity, sympathy, and forgiveness. The symbolic meaning of these practices is associated with their concern for conservation of forest cover and its resources. Another standard practice was to educate those who ascend the mountain to revere the scared footprints for the first time in accepted ethics and conduct (Wickramasinghe, 2003).

IV. TANK CASCADING SYSTEM (TCS)

“All components of the TCSs are man-made, firstly to provide water for human consumption and secondly, support the existence of local biodiversity and its ecosystem services” (Geekiyanage and Pushpakumara, 2013). Following essential components of the village tanks and their functions depict the environmental concerns of the ancient engineers.

Mukulana is the catchment forest cover of TCS, which was community owned and was protected by controlling the felling of trees and clearing for agricultural expansion. This forest fragment was valued for its environmental services by the village farmers and only used for sustainable extraction of some non timber forest products such as medicinal herbs. (Geekiyanage and Pushpakumara, 2013)

Gasgommana, the upstream land strip of the tank dedicated as an ecotone between humans and wildlife habitats. Large trees such as Kumbuk, Nabada, Maila, Damba, etc and climbers such as Kaila, Elipaththa, Kakukeliya, Kalawel, Bokalawel, etc were let to grown naturally in this land area. The roots of these large trees make water cages creating breeding and nesting places for fish species (Peiris et al, 2008).

V. TRADITIONAL FARMING PRACTICES

Traditional farmers acted as practitioners who transform, manage and use environmental process and nature. Instead of monoculture, poly-culture was prevailed in Sri Lanka as a sustainable farming system for more than 2500 years (Senanayake, 2006).

Collective decisions were taken by the community in terms of agriculture under the leadership of the village chief (Gamarala). Clearance of forest cover for chena cultivation was to be obtained by village chief. Permission of clearing

virgin forest was only given to newly married couples (Nawa Deli Hena), unless a strong justification should be provided for clearing virgin forest for cultivation. This symbolizes that the clearance of forest was not allowed haphazardly while a systematic code of ethics was existed in the traditional communities. Furthermore, traditional farmers used farming techniques with minimum disturbance to the nature such as minimum tillage, mixed cropping, direct seeding and mulching. Eco-friendly crop protection methods such as performing kems, rituals or religious rites along with locally made pesticides from plant extracts were utilized to control pests and weeds (Senanayake, 2006).

Moreover Kandian forest garden in Central Highlands was another agricultural practice that enabled the conservation of floristic diversity. Farmers grew both annuals and perennials under three-tier canopy systems and depended on the fruits and vegetables acquired from home gardens while a range of medicinal plants and herbs were also included to this system (Ganashan, 1995).

VI. RELIGIOUS ETHICS

Religions provide moral and ethical guidance for proper relationships amongst communities and even between people and nature. Local belief systems in Sri Lanka are largely intermixed, influenced and guided by the teachings of Lord Buddha. When analyzing the Buddhist teachings found in literature it can be seen that Buddhist environmental ethics were aimed at three groups in the society; monks, rulers and lay people.

Even the first sermon made in 223 BC itself encapsulate environmental concerns, as King Devanampiya Thissa was told by Arahat Mahinda, the king is only a custodian of the resources found in the land and he is the trustee not the owner, hence it is his duty to protect and preserve them. (Weeramantry, 2000)

Further, in Buddhist teachings, roles and duties of the rulers were also defined. Among these general duties environmental concerns were also included. It is said that royal duties include the protection of the weak; all life forms that are unable to protect themselves. Accordingly, since the faunal and floral species are unable to speak on behalf of themselves and fight for their own protection it is a state duty to protect them. (Weeramantry, 2009)

Sutta Pitaka, the scripture containing the Lord Buddha's sermons, encompasses evidences for ancient practice of environmental ethics. As such, in accordance with "Ten duties of the king" (widely known as the Dasa Raja Darmaya) stated in Kutadanta Sutta, it is stated that the king should take active measures to protect the flora and fauna. It is further elaborated that one of the major responsibilities of the king is to protect the trees and other organic life forms. Similarly, in Chakkavattisihananda Sutta also states an ideal king is bound to protect not only people but also all life forms (Weeramantry, 2009).

In view of the above mentioned examples it is apparent that the key responsibility of protecting all life forms was entrusted upon the state or the ruler. Since most of the ancient rulers were guided by the Buddhist monks and followed Buddhist principles, they were expected to perform the duties of an ideal ruler as indicated by the Buddhist scriptures.

Ideal role of the Buddhist at all levels from rulers to lay people was also defined in the Buddhist teachings. It is important to note that these regulations embedded into the societies as societal rules with the time, while contributing to the ethical development of society. Such examples are discussed as follows.

The minimal moral obligation of followers of Buddhism is the five precepts (Panchasila). These five precepts include abandoning the taking of life. It is also one of the main virtues discussed in Buddhism. It implies that all life forms must be respected, by restricting unnecessary and meaningless loss of life (ahimsa or non violence). This respect extends to plant life as well. Further, in Karaniya Metta Sutta also states that love and compassion should be extended to entire environment, as a mother would risk her life for her only child.

Noble eightfold path is the code of conduct for Buddhists leading to a proper human conduct. Essence of the noble eightfold path is that all conducts should be evaluated to identify the medium and long term impacts beforehand. All eight elements of the noble eightfold path can be interwoven with perspectives of environmental ethics. However, the choosing the right livelihood can be considered significant among them. This guides the Buddhist on the choice of employment. It is indicated that one must not choose an employment which destruct or exploit or pollute the environment. It is seen that these practices are not considered in current commerce-dominated generation, as most industrialists are

polluting and harming environment. Most pollutant generating industries like textile manufacturing are also labour intensive and holds higher percentage of employees in the country.

Apart from imposed regulations and rules, it is also important to note that the minds of followers were subjected to be nurtured by underlying environmental ethics. One of such example is the Vanaropa Sutta. In Vanaropa Sutta, as a reply to a question raised by a deity Lord Buddha describes the merit of the people who grow plants groves, parks, make pond and bridges, etc. grows day and night and such a person would go to heaven. (Weeramantry, 2009) By exposing into such statements, lay people and rulers were encouraged to behave in such manner. Even though establishing plants groves may not directly support the conservation of floral species, this would have made people aware that plants should be protected and cared. Since the raising awareness is also an important part to play even in modern conservational strategies. Further this may have been the precursor of the herbariums and botanical gardens.

In addition Buddhists have cultivated is a reverential attitude towards especially long-standing gigantic trees. They are even referred as *vanaspati* in Pali, meaning "lords of the forests" (Sahni, 2008). As most of these huge trees such as the ironwood, the sala, and the fig are also recognized as Bodhi trees of former Buddhas, the referential attitude is further strengthened (Sahni, 2008) For example, *Ficus religiosa* is an object of great veneration among Buddhists as the tree under which the Lord Buddha attained Enlightenment. People refrained from harming or felling of such trees as self imposed sanction. These were further enhanced by the statement found in Pretavatthu of Sutta Pitaka saying one should refrained from even breaking branch of a tree that has given one shelter. Buddhist teachings also suggested since trees provide us with certain benefits hence we should be grateful in return and not resort to cutting them down. (Sahni, 2008; Weeramantry, 2009) This way of thinking can be linked with modern concepts of utilization of environmental services as in economic evaluation of ecosystems.

Apart from the regulations and obligations imposed on rulers and peasants, Buddhist teachings also laid down certain regulations and ethics for monks too.

In the Vinaya Pitaka, the scripture containing the code of disciplines and defines offences, enlist 227 precepts to be followed by Buddhist monks. It provides supportive evidences that the Lord Buddha extolling monks not to harm plants. Buddhist monks are refrained from polluting green grass with saliva, urine, and feces according to Vinaya Pitaka. There are injunctions specific to *Patimokkha*, disallowing injury to plants Destruction of vegetable growth by five different propagation types: from roots, from stems, from joints, from cuttings and from seeds was considered as an offence of expiation (Sahni, 2008). Hence almost all the vegetation propagate through one or more types of propagation as mentioned above it can be considered significant drive towards protection of plants.

In accordance with *Sutta Pitaka* it is prohibited to throw left-over food where there are green plants or in water with living beings (Sahni, 2008). According to Samannaphala Sutta, higher ordinate monks are prohibited from destroying trees and creepers if any destructive deed upon the organic environment were done it was considered as a breach of sila or virtue. In addition, *Brahmajala Sutta* of the *Digha Nikaya* contains additional observances for monks which include abstaining from the destruction of seed and vegetable growth (Sahni, 2008). Abatement of the destruction upon the seeds also evokes that not only the current generation of vegetation but also the future generations were also implied to protect.

Additionally, most Buddhist literature supports the meditation in deep the deep recesses of nature; in forests and groves, without the mundane disruptions of community life to attain higher spiritual states. Since these places were occupied by meditating monks, people avoided entering and harming or felling trees.

VII. CONCLUSION

Traditional environmental ethics discussed on above three areas have remarkably contributed for conservation of floristic diversity of the country from the time immemorial. Many of them were solely for the preservation of floral diversity while some of the ethics partially addressed the conservation of floristic diversity. It is also noteworthy that in certain occasion's appreciation of only specific and isolated sites and species are seen.

Though some ethics and practices are still continued among farming communities and religious groups in rural areas, the extent of usage is not in a satisfactory level in achieving conservation of floristic diversity. It is an urgent necessity to

collect and preserve above stated traditional ethics and put them to use to ensure the long lasting conservation of floristic diversity without alienating them. This review evidently emphasizes that practicing of traditional environmental ethics are complimentary in preserving floristic diversity of the country. Sustainability in conservation of diminishing floristic diversity could not only be achieved through implementation of modern conservation practices, Traditional environmental ethics always owes a key role to play with this regard.

VIII. FUTURE DIRECTIONS

As Sri Lanka possesses more endemic flora per unit area than any other country in Asia, its conservation is of paramount importance (Karunaratne, 2013). Also Sri Lanka comprises of rich religio-cultural background that included profound conservation ethics among the people. Presently general public should be strongly motivated to conserve the biodiversity with the aid of ethics, for that awareness programs are deeply required as initiatives (Gunathilaka, 2008). Simultaneously ample of research are required to investigate the level of environmental ethical practices among rural and urban communities of the country for effective conservation of floristic diversity. Observations and results of such research could be useful to reflect effective decisions in policy making with regard to conservation of floristic diversity, ultimately the biodiversity of the country. Conservation of floristic diversity with the aid of environmental ethics should be included to national forest policy in a more concrete manner. Subsequently hidden and erasing environmental ethics are needed to be well documented despite letting them to bury unknowingly.

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