

Sustenance of Biodiversity in the Sinharaja World Heritage Site, Sri Lanka through Ecodevelopment of the Buffer Zone

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Sri Lanka like much of the world is at an important stage of redefining national forest and village development policies to contend with the increasing threats to biodiversity. Among the most endangered areas in Asia is the Sinharaja Forest despite its designation as a UNESCO World Heritage Site (WHS).

The need for subsistence and income among a rapidly increasing local population has not only increased illegal extraction from the WHS but also has spurred encroachment for cultivation of tea. The emergence of tea as a lucrative small holder crop has transformed the village economy in the Sinharaja buffer zone and is attracting new immigrants to the area. The unprecedented increase in tourists to Sinharaja is a further threat.

The Sustainable International Development Program of the Heller Graduate School at Brandeis joined forces with the government of Sri Lanka and local NGOs to create the National Eco-development Steering Committee in 1994. Chaired by the Additional Secretary for Rural Development of the Ministry of Finance and Planning, the Steering Committee had high-level representatives of the Forest Department, Ministry of Environment, and other key groups. A planning grant was provided by the Biodiversity Conservation Network, a USAID funded project of the World Wildlife Fund, the Nature Conservancy, and World Resources Institute.

Planning for an integrated approach to conservation through development took place over a three year period through an extensive community-level participatory planning process on land use, community economics, non-timber forest product extraction, and planning for viable livelihoods. Special attention was paid to gender roles and leadership.

One of the key decisions made with the communities was to found a bufferzone-wide organization called the Sinharaja Village Trust (SVT). No locally-based organization yet existed that could harness the resources of the communities and forge the vision of eco-development that was needed to carry out the objectives of conservation education, social mobilization, economic planning, applied research, and effective monitoring of ecological and socio-economic changes.

The SVT employs an enterprise-based approach to conservation. Emphasis is placed on community enterprise groups that are helped to develop training, private sector partnerships, and linkages to markets. SVT also takes on the role of negotiating with national entities for better buffer zone management.

Using a credit-based model, the SVT provides financing to enterprise groups which have successfully undergone human resource training and have developed sound business plans that meet both investment and conservation requirements. The credit fund was capitalized by the MacArthur Foundation.

The terms of lending are based on the culled experience of credit programs worldwide. The structure of the credit fund permits steady growth in its assets with cumulative disbursements over the first three years of US \$279,000.

All activities of the SVT address and strengthen the link between enterprise and biodiversity. SVT recognizes the traditional use of non-timber forest products (NTFP) and uses SVT capital to shift NTFP extraction to outside the strictly protected WHS. Current environmentally unsound practices are being corrected through incentives, education, and training as well as the lure of SVT marketing channels. NTFP cultivation on buffer zone plots will also ease the pressure on the core forest.

SVT lending centers on several products with demonstrated market appeal: kithul (a palm sugar), rattan, cardamom, and the medicinal plant Weni Wel.

Turning a growing threat to biodiversity into an asset, the SVT is seeking to help manage a low impact ecotourism which can also derive economic benefits to buffer zone communities. This unifying economic activity provides a market for value-added cottage industries, employment, partnerships with private sector firms, and a compelling incentive for forest conservation among the villagers.

Now the Center for International Development at the Heller Graduate School at Brandeis continues its close involvement with the SVT through staff training and applied research, as well as helping to represent the SVT with development institutions internationally. It is also a site for SID graduate student fieldwork. One student recently completed the first Geographic Information System database to be used for project planning and monitoring.

A Living Laboratory: Biological and Other Significance of the Sinharaja World Heritage Site

The WHS is a lowland rain forest of 11,000 hectares located in the south west of Sri Lanka. Together with several forest reserves contiguous with Sinharaja – Morapitiya-Runakanda, Delgoda, Panagala, Dellawa, Neluketiya and Warathalgoda – and which were managed for commercial timber production until recently, the total area is about 47,370 ha.

The Sinharaja WHS and the adjacent forests are the last sizable remnant of Sri Lanka's lowland rain forests. The nearest natural forests of comparable richness are those of Madagascar and Sumatra.

The flora and fauna of the Sri Lankan rain forests have a high proportion of endemic species (50% vertebrate fauna and 70% flowering plants). Scientists speculate that the flora of south western Sri Lanka played an important role in regional plant geography (Aston and Gunatilleke, 1987). Eleven distinct 'floristic zones' have been identified

among the plant communities of the south west region and Sinharaja represents two of these. Among the vertebrate faunal groups examined – fish, birds and mammals show localization of species in the lowland wet forests.

The Sinharaja area also has significant watershed and cultural value. The forest feeds two major rivers. For centuries Sinharaja has been revered due to mythical links with legendary beginnings of the Sinhala people. This respect led to the public outcry in the 1970's which brought a halt to the logging of Sinharaja (de Zoysa and Raheem, 1990).

Endangered and Threatened Species

In Sinharaja, threatened species are more the rule than the exception due to many contributing factors: the tiny extent of the remaining lowland wet zone forests, the high levels of endemism and localization among the flora and fauna, coupled with forest fragmentation.

In a recent analysis of 184 endemic tree (and woody climber) species sampled in floristic inventories of 5 sites in Sinharaja and 2 other lowland rain forests, researchers classified 93 percent as threatened – endangered, vulnerable or rare according to the IUCN Red Data Book criteria (Gunatilleke and Gunatilleke, 1991).

A survey of rattan by the Forest Department classified the 5 rattan species found in the Sinharaja area as threatened, and concluded that Sinharaja is the only location where sizeable mature populations of the commercially important giant rattan species (*Calamus zeylanicus*, *Calamus ovoideus*) exist. Both species are endangered (de Zoysa and Vivekanandan, 1994).

Sinharaja may also be the only location where the rare and prized species of ebony known as Calamander (*Diospyros quaesita*) is found. Studies indicate the endemic fauna account for the greater majority of threatened species (Kotagama, 1989). Recent studies show that wildlife in Sinharaja is under acute threat due to illegal hunting and poaching (Lubowski, unpublished).

Economically and Culturally Valuable Species

An ethnobotanic survey of 84 households in 12 villages in the buffer zone of Sinharaja, conducted in 1985 by the University of Peradeniya, listed 197 wild species useful to the communities (McDermott, 1990). Later studies by the Forest Department and Peradeniya University in collaboration with Yale and Harvard Universities confirmed several forest plant and animal species which were economically significant to the villages: viz. Fuel wood and timber from a variety of species, sugar palm or 'Kithul' (*Caryota urens*), rattan (five species of *Calamus*), Cardamom (*Elettaria ensal*), and the medicinal vine 'Weni Wel' (*Coscinium fenestratum*), Bamboo or 'Bata' (*Ochlandra stridula*) fuel wood, fruits and leafy vegetables, many medicinal trees and herbs, fish and meat from wild pig (*Sus scrofa cristatus*) and sambhur (*Cervus unicolor*) are important categories consumed domestically (de Zoysa, 1994; Gunatilleke *et al.* 1994; Lubowski, unpublished).

The 1995 study also showed that 83 out of the 197 plant species used have medicinal value for the villages (McDermott, 1990). Many of these, including the vine Weni wel, are of importance in the ancient ayurvedic system of traditional medicine. In preliminary

studies by the Peradeniya University to assess the impact of modernization on folk knowledge about plants in two Sinharaja villages, 169 medicinal species still used by the people were listed. The study concluded that this knowledge is fast eroding (Manikrama, 1994).

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