

Engaging eco clubs in India's natural heritage: botanical garden as a place for environmental education: a case study from Tamil Nadu

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Introduction

In India botanical gardens are the places where people gather in a particular time for a function, relaxation, and to pass the time; in fact they learn little about plants. A classic example is the Ooty Botanical Garden in the Western Ghats, which is a hill station that holds an annual flower and fruit show in the month of May. Enormous crowds will come to enjoy the beauty of the Garden during that time. Due to climatic conditions, the number of visitors will be less in other months. It is same in other botanical gardens in India: people just go there for relaxation or as an excursion.

In 1992, the Coimbatore Zoological Park and Conservation Centre (CZPCC), situated 30 km west of Coimbatore city and about 90 km from Ooty, established a botanical garden in Anaikatty in the foothills of the Western Ghats for the purpose of conserving the local fauna and flora of the Nilgiri Biosphere Reserve (NBR) and to use this facility to teach about plant conservation to the public, students and others. The botanical garden will be a true replica of the NBR, focusing on the conservation of, and education about, its flora and fauna (Walker *et al.* 2004; Rathinasabapathy, 2006). Its mission fits well with the aims outlined in the *International Agenda for Botanic Gardens Conservation*.

Ecological restoration

The CZPCC had started ecological restoration work in the site, which was originally barren land (Fig.1), and the first planting was started during October 1992 with common species such as *Albizia amara*, *Dendrocalamus strictus*, *Carissa carandus*, *Ailanthus excelsa*, *Erythrina variegata* and it is still going on. Since then, the continual planting activity has been increased and extended to around 70 acres of land, in the middle of the hill slopes (Fig.2). Because of the continual planting activities in the last 17 years the soil pH, which used to be 8 in the beginning, has now come down to 7.

The level of the groundwater table also has risen, due to rainwater percolation and the accumulation of



Fig.1. Before site restoration in October 1992



Fig.2. After site restoration in 2008

humus layer in the soil. Since the site is adjacent to the NBR, the planting activity is restricted to plants typical of the Western Ghats and the NBR, which are acquired from various NGOs and the government sector. The restoration of deforested land will promote seed dispersal across the landscape by facilitating animal movement; the remnant vegetation provides a source plant resources that already exists and should be protected or enhanced first (Kanowski *et.al.*, 2003).

Impacts of Ecological Restoration

At late 2009 the plants species present at CZPCC number nearly 520 species, of which 140 species with 12,000 individuals are in the nursery and 430 species with 32,000 individuals are planted in the field. Because of the ecological restoration the park attracts wildlife species such as wild boar (*Sus scrofa*), porcupines (*Hystrix indica*) spotted deer (*Axis axis*), the small Indian civet (*Viverricula indica*), 10–12 species of snakes, 40–45 species of butterflies (Fig. 3) and 110 species of birds from the nearby mountain forests. The present biodiversity of CZPCC presages the opening of the Park to the public; it will also serve as a resource centre for the NBR.

The restoration has enhanced the populations involved in seed dispersal, especially birds and mammals. These provide a positive feedback through the dispersal of more seeds in the landscape and add to the species diversity by the immigration of species from neighbouring regions. The diversity of insect pollinators is increased. The role of seed and seedling predators is also increased. For example, the number of sandalwood trees (*Santalum album*) at CZPCC site at the beginning of ecorestoration was nil. The present survey indicates there are now 520 sandalwood trees present. This increase has been bought about through bird/mammals seed dispersal. Several butterfly host plants are planted in the Garden, of which species such as *Crotalaria longipes* attract regular migrant butterflies, such as the blue tiger (*Tirumala limniace*) and the striped tiger (*Danaus genutia genutia*). We have a record of the entire life history of both species. Regular data collection is in progress to assess butterfly diversity and abundance in different seasons.



Fig.3. *Crotalaria longipes* with blue tiger butterfly (*Tirumala limniace*)

Formation of eco clubs

After ecological restoration, the Society felt that that the facility could be used to teach environment subjects, especially plant conservation, to students in urban as well as rural areas by means of environment education programmes. So we started formal and informal education activities on the site. In November 2004 we received a grant from Botanic Gardens Conservation International (BGCI) through their Investing in Nature programme, under BGCI and NBRI's National Plants Conservation Programme. With this assistance, we initiated eco clubs for school and college students with the objective to "Educate students on the importance of Nilgiri Biosphere Reserve".

Regular annual activities for eco club members are:

- Green Classes for the members in the Schools and colleges, with audiovisual presentations.
- Members are taken to CZPCC Botanical Garden for an exposure visit.
- Members are encouraged to participate in events such as Wildlife Week Celebrations, World Environment Day World Forestry Day and World Wetlands Day.
- Members receive an annual certificate.
- Schools are given an affiliation certificate, which will help them in getting ISO Certification etc.,
- Consultancy may be given to other schools.

Fig. 4 shows the annual increase in the number of students enrolled in the eco clubs at various institutions. Their interest in plant conservation is shown by the establishment of kitchen gardens, flower gardens, school campus tree planting and roadside tree planting. Every year the eco club members celebrate World Environment Day and World Earth Day by planting tree saplings.

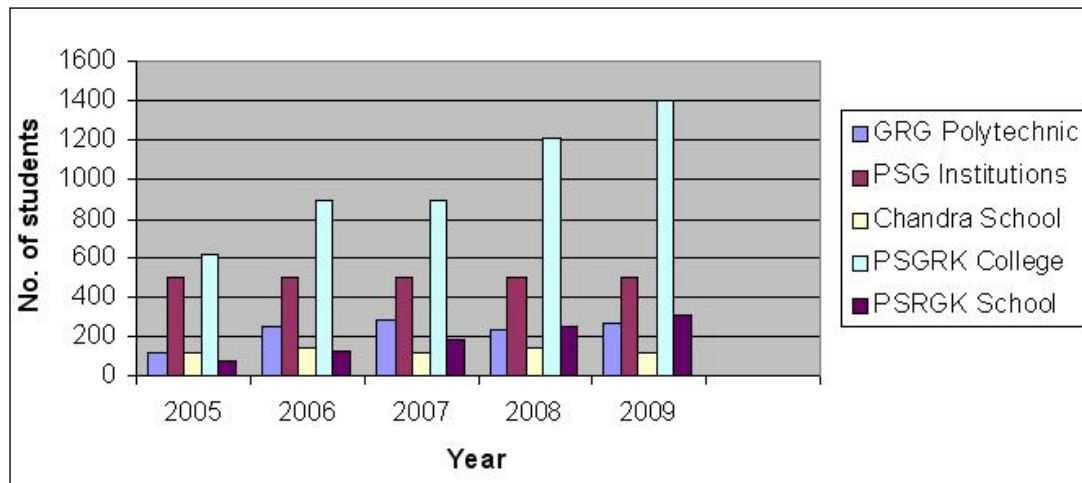


Fig 4 Eco club students at various institutions

Other eco club-related activities

Biodiversity Awareness

Using the resources on site we are carrying out several formal education programmes at school and college levels. Informal environmental educational was organized for visitors to the Garden on the importance of plants and animals. Between 2005 and 2009, 24 programmes were organized in association with local institutions involving various target audiences both in gardens as well as in institutions. In due course the fully-fledged facility will be operated through various sponsored and planned events.

The Amphibian Ark

CZPCC was part of the Amphibian Ark's Year of the Frog (Rathinasabapathy & Kalairasan, 2008)) and conducted many frog-awareness programmes, such as the Save Amphibian Signature Campaign and the Global Leapfrog Event. Students from PSGR Krishnammal School and local tribal students participated in the Global Leapfrog Event organized at Anaikatty during December 2007 (Fig 6). Zoo Outreach Organization (ZOO) amphibian education packets were used as resource materials and distributed to all the participants. Emphasis was given through this programme to different ecosystem and role of amphibians.



Fig.5. Eco club members during their visit to the CZPCC Garden



Fig. 6. A giant leap for amphibian-kind ... one more step to save the frog.

The winner of the event received an attractive tee-shirt offered by ZOO and also a participation certificate. About 70 students and five teachers benefited from this programme.

National Wildlife Week celebrations

In India, the celebration of National Wildlife Week takes place in the week of 1–7 October every year. It is one of the main events for promoting biodiversity conservation amongst Indian people. In this period, governmental and as well as non-governmental organizations conduct various programmes on various themes to promote wildlife conservation at the national level. CZPCC is part of these events and carries out plant conservation awareness programmes in the Coimbatore region. In the years 2007 and 2008 it was celebrated at Anaikatty by conducting drawing and essay writing competitions for school students; 200 students took part in the events each year and benefited through them.

Research Activities by students

We encourage students to undertake a short-term research project as part of their curriculum. During the year 2006, three undergraduate students from Krishnammal College did project work on biodiversity and the ethnobotany of tribal and medicinal plants of the Anaikatty region. The biodiversity of the Botanical Garden has been documented regularly to know its abundance and richness. Several projects identified for further study include seed dispersal by birds and mammals, pollinating insects, pests and diseases of plants.

Conclusion

Since 1992 the CZPCC has been doing its regular environmental education programme about biodiversity conservation in the Nilgiri Biosphere Reserve for school and college students and general visitors. The Founder and Committee Members of CZPCC – Jersey Wildlife Preservation Trust, Botanical Gardens Conservation International and the Zoo Outreach Organization – have generously supported all these activities. The formation of eco clubs has shown increased interest among the student community. In the long run we anticipate support from international agencies for effective outreach programmes, using the CZPCC Botanical Garden as a resource centre for the Nilgiri Biosphere Reserve.

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