

## Educating for Environmental Sustainability

### ***Does Sustainability Mean Sacrifice? An Example of Environmental Education Across Two IB Programmes in South India.***

#### **Abstract:**

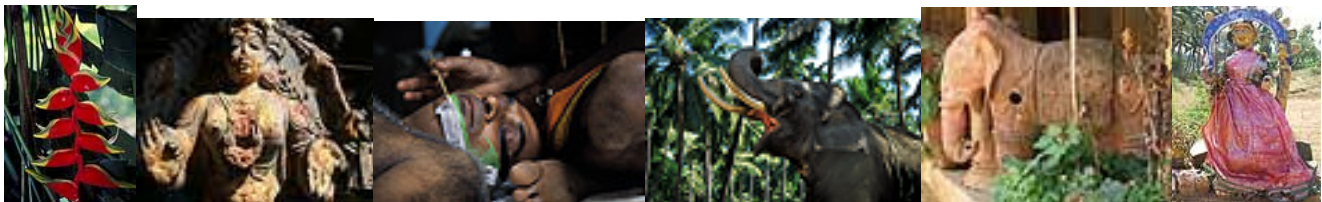
*Local examples are a powerful tool in the teaching of sustainability in IBO programmes. At KIS Grade 9 students travelled to the coast of Tamil Nadu to visit a reptile conservation project, a snake hunting Adivasi cooperative and met individuals in Auroville who had given their lives to work on afforestation, organic gardening, soil and water conservation and environmental building research. The students focus was the guiding question, "Does sustainability mean sacrifice?" Kodaikanal is located in a Global Biodiversity Hotspot but is at the heart of human interference in a complex set of ecosystems known as "sholas". Here, tropical montane evergreen rainforests form a patchwork with tropical montane grasslands. Heavy population pressure has caused loss of biodiversity in some of the less leech-prone forests while the grasslands have suffered from plantation forestry. For over 20 years the Vatakanal Conservation Trust (VCT) has worked to preserve and restore these ecosystems. They provide an example of the importance of community education to help restore the sholas. This provides an interesting set of local examples for Diploma students to study. Linking the MYP and DP is possible with the practical opportunities of C&S and CAS. Projects were set up with VCT to help improve and restore these ecosystems. Students were challenged to wonder why cutting down trees could possibly help the environment. Long-term planning is often a concept alien to children and so these projects gave the students a practical example of how their present actions could have an impact on future generations.*

**AIMS:**

- Illustrate how we used field trip opportunities in South India to provide students with opportunities to engage in thinking about sustainability.
- Emphasise importance of using local examples and for management to support teachers in making these links.
- The need for students to be given opportunities to participate in local projects so that they see examples of they can become more sustainable.
- To ensure that students don't just hear about local examples but also touch and feel local examples.
- To propose that students are challenged to think about their actions and how they can make a difference.

**Introduction:**

I'd like to take you to a far, far away place. Somewhere shrouded in mists and teeming with life; somewhere where tree frogs sing you to sleep; high in the mountains where granite peaks are clothed in green and red with occasional flashes of pink or orange; wild pepper vines creep up tree trunks and citrus creepers wind their way down towards you; oh and leeches and ticks love to find every body crevice you never knew existed! There's colour and spice in the air and it's a traveller's paradise.



Kodaikanal International School is located in an eastern spur of the Western Ghats. An ancient chain of mountains which run down the west coast of India, these are all that remain of what must have once been mighty mountains produced as India rafted northwards over tectonic hotspots<sup>1</sup>, separating from Gondwanaland, to collide with Tibet and create the Himalayas and the Tibetan plateau.

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<sup>1</sup> [http://www.wii.gov.in/envis/rain\\_forest/chapter2.htm](http://www.wii.gov.in/envis/rain_forest/chapter2.htm)

Due to the a number of factors, including the great age of the mountains, their geological isolation, high monsoon rainfall and individual isolation of mountain peaks and valleys, the Western Ghats form one of the world's biodiversity hotspots. There is a complex pattern of vegetation with scrub forests in the low-lying rain-shadow areas and the plains, deciduous and tropical rainforests up to about 1,500 meters, and a unique mosaic of montane forests and rolling grasslands above 1,500 meters<sup>2</sup> and rising to over 2500 meters. This mosaic of forest and grasslands is known as a "shola" ecosystem.

The endemism in the Western Ghats is very high with over 70% of freshwater fish and amphibians and 65% of reptiles endemic to the Western Ghats and almost half of all the plant species unique to these mountains. Examples of endemic species are the Lion Tailed Macaque and Nilgiri Tahr, Paradise Flycatcher, Malabar Pit Viper, Malabar Frog and Kurinji Flower which only flowers every twelve years and flowered in 2006.

### Endemic species of the Western Ghats<sup>3</sup>

Group	Total Species	Endemic Species	% Endemism
Plants	5916	3049	51.5
Freshwater Fish	191	139	72.8
Amphibians	178	130	73.0
Reptiles	267	174	65.2
Birds	458	35	7.6
Mammals	140	18	12.9



These shola ecosystems are highly endangered. Some British colonialists described the highland grasslands as wastelands<sup>4</sup>, thought they would be ideal for plantation forestry and so instigated some devastating land use changes. The Forest Department of Tamil Nadu continued in this vain and in the 1970s and 1980s there were large-scale plantings of Eucalyptus, Pine and

<sup>2</sup> <http://www.biodiversityhotspots.org/xp/Hotspots/ghats/Pages/default.aspx>

<sup>3</sup> <http://www.biodiversityhotspots.org/xp/Hotspots/ghats/Pages/default.aspx>

<sup>4</sup> Personal Communications: Henry Noltie, RBGE, Uk, November 2004; Bob Stewart, VTC, India, April 2007.

Acacia in the highlands around Kodaikanal. This has, in fact generated a large local tourism trade as tourists from the plains come to see the curious phenomena of pine forests! This has been enhanced by the shooting of Tamil films in the cool forests and around the viewpoints in the hills.



A combination of planting trees on natural grassland and unsustainable development around Kodaikanal has seriously threatened the balance of water in the hills, and the reservoirs are drying up. The township continues to bury its head with its search for suitable bore-well sites<sup>5</sup>. Along with the change in hydrology around the Palani Hills, there has also been a hard to document loss of Biodiversity. The light-loving plants of the grasslands have not been able to survive the high shade environments of the plantations and many species may have been lost forever.

This complex ecological scenario has provided an excellent set of local examples for my Diploma Environmental Systems students to study during their course and their field work.



- The shola ecosystem was studied as a system emphasising the human induced changes.



- The shola forests were used to compare abiotic and biotic factors.
- Environmental gradients were studied by using transects from plantations into natural forests.



- Food webs were constructed using real organisms from the shola ecosystems.



- The weaknesses of diversity indices were perfectly illustrated by the collecting data in the biodiverse sholas.

- Sustainability of freshwater use was linked to Kodaikanal's situation.

- The shola ecosystem provided a case study of a threatened habitat.

- And students were excited at the prospect of planning how to assess the size of the leopard population around Kodaikanal!

<sup>5</sup> Personal Communication: Bob Stewart, VTC, India, September 2007.

At Kodaikanal International School I was also the MYP Coordinator and every year all students participate in a week without walls field trip. For the Grade 9 field trip I coordinated an MYP interdisciplinary Unit which focussed on the idea of sustainability. At the beginning of the unit, students didn't know what the word sustainable meant and so it was exciting to see their growth in understanding during this experiment.

For this Grade 9 field trip we visited two projects around Mamallapuram, where the famous shore temples are located, and several projects in Auroville.

### The Irula Project



The Irulas are, in old parlance, a tribal group but are now known as Adivasi, "Original Inhabitants". This particular group of Adivasi were well known for their snake hunting skills. This was utilised by a visionary group of people who



established a venom extracting scheme using the Irula's skills, earning the Irulas money for each snake caught. During the field trip students were able to meet the snake catchers, herbal medicine experts



and Rom Whitaker a Kodai School Alumnus and world reptile expert who spoke about his work. The children interacted with these people and saw how conservation and sustainability can work hand in hand. They asked lots of questions but the most intriguing for them was had Rom ever



caught an Anaconda!

### The Croc Bank



The Croc Bank is a reptile conservation centre established by Rom Whitaker on the outskirts of Mamalipuram and on the main coastal road to Chennai. They keep 14 species of crocodiles and 14 species of turtles, lizards and snakes<sup>6</sup>. It is also a premier institution for herpetological research, houses one of the best herpetological libraries in Asia and is at the forefront of herp conservation in India with a major tortoise and turtle project in the north, the

<sup>6</sup> <http://www.sanctuaryasia.com/interviews/romwhitaker.php>

new gharial (an endangered fish eating crocodile from the Ganges) conservation initiative and a research base in the Andaman Islands. Here the students were introduced to some of the people involved in herp conservation and they were also able to partake in some active work with the crocodiles, cleaning their pits and taking some measurements of the crocodiles themselves which involved some Indiana Jones style manoeuvres.

## Auroville



Auroville was

founded in the 1960s following the idea of The Mother and the suggestion by the Sri Aurobindo Society in Pondicherry that a universal township should be established near there. The Government of India gave their backing and a unanimous resolution supporting the project was passed by UNESCO. It is recognised as the first and only internationally endorsed ongoing experiment in human unity and transformation of consciousness. Auroville is also concerned with and practically researching sustainable living and the future cultural, environmental, social and spiritual needs of mankind.

Before the accelerated exploitation by the British, the Coromandel Coast, of which Auroville is part, was covered in Tropical Dry Deciduous forest and elephants and tigers roamed the forests. The British organised the whole sale clearance of the area for timber exports and temporary agriculture but the monsoon rains eroded the soil and the earth is now red and is scarred by gullies and ravines. Each year tons of the remaining topsoil is swept into the Bay of Bengal.

The Auroville settlers needed shade and water and started to reclaim the land by enclosing land, protecting it from grazing, planting trees and raising bunds. These bunds required some trial and error but eventually the best solution was to start at the top of the watershed and follow the topography of the land<sup>7</sup>.

During the packed schedule at Auroville students stayed at the Centre Guest House run by a long-time member of the Auroville community and ardent environmentalist, Tineke. Tineke

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<sup>7</sup> [http://www.auroville.org/environment/env\\_introduction.htm](http://www.auroville.org/environment/env_introduction.htm)

was travelling the world in the 1980s, arrived in Auroville and stayed. They visited the Matrimandir, the spiritual and physical heart of the township, toured the area to see examples of renewable energy and visited the centre for scientific research in environmental architecture and building, worked in an organic farm garden, met the architects of the water management projects and met an Israeli family who had given up their lives in Israel to live in thatched bamboo huts and plant trees in inhospitable, raped red land, now slowly becoming Sadhana Forest (sadhana means accomplishment or rectify in Hindi<sup>8</sup>).

In terms of an understanding of sustainability, this was perhaps the most thought provoking part of the trip. The students actually met and spoke to these people who had changed their lives in order to live more sustainable lives. Priya was from England and now ran the organic farm, training local Tamilians in organic farming techniques; Kireet was from the Netherlands and was working to help turn the Auroville plateau green again and teaching people about water saving technology; and Aviram was establishing a sustainable community and Sadhana Forest. The students were particularly challenged by Aviram's life which was incredibly simple with no electricity or sewage system. He had been a CEO of a large medical firm in Israel before his life change. They just couldn't imagine having to switch off the solar powered computer when the sun went down or not being able to watch the Premier League on TV. When we discussed our guiding question "Does Sustainability Mean Sacrifice?" the students were quite shocked to understand that Aviram didn't see his life change as a sacrifice but as a bonus, a life-fulfilling experiment. They certainly felt that he had sacrificed a lot but I think it helped them to make that mental leap into thinking about what sustainability might mean and how their lives could be made more sustainable while still enjoying some of their creature comforts.

Back in the relative comfort of school, students worked on presentations, films and posters, in their own time, about their experiences and reflected on their trip during their interdisciplinary units in Science, Languages B and A and Technology.

I'd now like to show how we linked the DP and MYP programmes through practical action on sustainability.

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<sup>8</sup> <http://dsal.uchicago.edu/dictionaries/platts/index.html>

## Putting Sustainability into Action: Community & Service and CAS

KIS has an enviable set of campuses around Kodaikanal, bequeathed by the many missions who were the founders and original users of the school. These range from the manicured main campus to semi-wild jungles of exotic trees which have become extremely overgrown. One of the wild areas is located next to one of the more degraded shola forests, Bombay Shola, named as a man from Bombay lived near there when the town was first established . This is the closest shola to the town centre and is frequented by cows, tourists and wood gathering villagers.



Vatakanal Conservation Trust has been working on eco-restoration in the Kodaikanal area for over 20 years after an English couple, Bob and Tanya, stumbled upon the area in their wilderness years escaping Thatcher's Britain. Their initial work utilised Bob's skills as a youth

worker as they mobilised the local youth in tree planting and protection. This community education work has proved to be critical. Working with this NGO I hatched a plot to return this campus to native vegetation which could then act as a seed bank and repository for the planned restoration of Bombay Shola. The plot was itself seeded by the energy and enthusiasm of one of our senior students, Jessica Lim. She had learned about the plight of the sholas in her Biology lessons and decided to raise money to help save the Sholas. A talented artist, Jessica designed and printed tee-shirts which she sold to students, raising a considerable sum of money. With this money, she approached me and we decided to donate the money to the Vatakanal Conservation Trust who would in turn donate trees, expertise and advice to the newly formed Claverack Eco-Restoration Project.



Armed with the Tamil version of machetes (arivals), gloves, cookies and fresh lime juice, I worked with an ever growing team of students to clear the invasive Acacia, Eucalyptus, Cypress and Pine trees which had over run our plot then slowly we reclaimed the site and planted native shola trees. The project is in its early days yet and future plans include regenerating grassy areas, improving the herb layer and building guided trails through the area. During our work, conversations challenged the children to think about what they were

doing. They found it very strange that we were cutting down trees for a conservation project but they began to understand and also engaged in bigger ideas about conservation and sustainability.

## **Conclusions:**

I'd like to summarise with some observations and suggestions for other schools.

- In this Asia-Pacific region, it is really easy to find examples of amazing work by small groups. Use these local examples in teaching and project work. They are very, very powerful tools in the teaching of sustainability within the IB programmes.
- If you are an administrator, encourage your teachers and organisation to engage with local organisations. This is another powerful tool at your disposal.
- In the teaching of conservation, and in practical work, emphasise the importance of community education.
- Link the MYP and DP programmes with practical opportunities in C&S and CAS.
- Engage students in long term planning and projects. The idea of the future is a concept which is alien to many of the human race but especially children. Using long term projects is a chance for the students to see how their present actions can have an impact on future generations.
- If your school doesn't already run the Environmental Systems and Society course, initiate the course. It really is a great way for students to engage in issues which are of the utmost importance in our world.
- If you are from the IB organisation, allow students to take Biology and Environmental Systems. Many students are interested in both courses and the more students taking the Environment course the better (in my opinion).

Finally I'd like to leave you with a video I made for the MYP Heroes event we organised at KIS. This special event involved students in Community and Service by studying people who had been active in Community and Service activities but I tried to emphasise the point that they too could be heroes!

## Acknowledgements

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- The Riverside School – agreeing to sponsor my attendance at the IBAP 2007 conference.

## Some useful references:

The Croc Bank: <http://www.madrascrocodilebank.org/Aboutus.htm>

Rom Whitaker: <http://www.sanctuaryasia.com/interviews/romwhitaker.php>

Auroville: <http://www.auroville.org/>

Kodaikanal International School: [www.kis.in](http://www.kis.in)

## Biography:

Dr. Zoe Badcock gained her Ph.D. in Plant Evolutionary Biology and Taxonomy at Glasgow University where she worked closely with researchers at The Royal Botanic Gardens in Edinburgh and Kew. She then turned to education and after completing a PGCE at Durham University worked in a state school in the north of England. Itchy feet and an urge to see the natural environments that she had studied took her around the world visiting the temperate rainforests of the Andes, Canada and New Zealand, the arctic-alpine flora of mountain tops in 3 continents and the tropical rainforests of Malaysia and India amongst other ecosystems. At Kodaikanal International School, the first IB Diploma School in India, she taught Environmental Systems and coordinated the successful introduction of the MYP. She now works at the Riverside School in Switzerland teaching MYP Science, AP Biology and Environmental Science and continues to examine the IB Diploma in Environmental Systems.

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