Biodiversity, Energy and Science

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We are living in very troubled times in Sri Lanka (and in many other regions of the world). Such turbulent times are turned to profit by some who, without fanfare, indulge in scams of one kind or another.

Another characteristic of troubled times is that environmental and ecological considerations often take a severe beating. For instance, the bombing in Iraq is undoubtedly wreaking havoc on the wildlife and archaeological artefacts of that country, although one rarely sees news reports bearing on these issues.

The problems we have been facing in Sri Lanka for over two decades now are resulting in certain matters being overlooked or put to one side. In other words, while our attention is being occupied by day-to-day worries, such as murders, the ceasefire etc., insufficient attention is being paid to the usual checks and balances and the work which needs to be done. This is expressed succinctly by the American saying 'When you are up to your arse in alligators, it is difficult to keep in mind that your initial objective was to drain the swamp'.

One aspect, which merits being kept in the forefront of our minds, is that in our haste to welcome foreign investment we do not admit industrial activities, which would not be tolerated in the home country due to environmentally-harmful repercussions. Although we are by no means an industrialised country, we already have experienced instances where citizens have taken polluting industries to court after they commenced production.

Another problem that is creeping up on us is the gradual elimination of our indigenous fauna and flora. There are those, whose viewpoint is anthropocentric, who take the attitude that if some activity (e.g. the introduction of exotic invasive weeds into pasturelands) boosts the GDP, then any critical view expressed by environmentalists is just being alarmist or obstructionist. A lesson we should take from the past in this respect draws on the felling of mangrove trees and filling in of their habitat around the coast in order to create land for the cultivation of coconut. It was, presumably, not appreciated by the decision makers at the time that mangrove swamps constitute a valuable breeding ground for marine fish and crustaceans. The destruction of these breeding grounds has contributed to our having to import tinned and dry fish from foreign lands today, in addition to leaving coastal areas exposed to erosion and tsunamis.

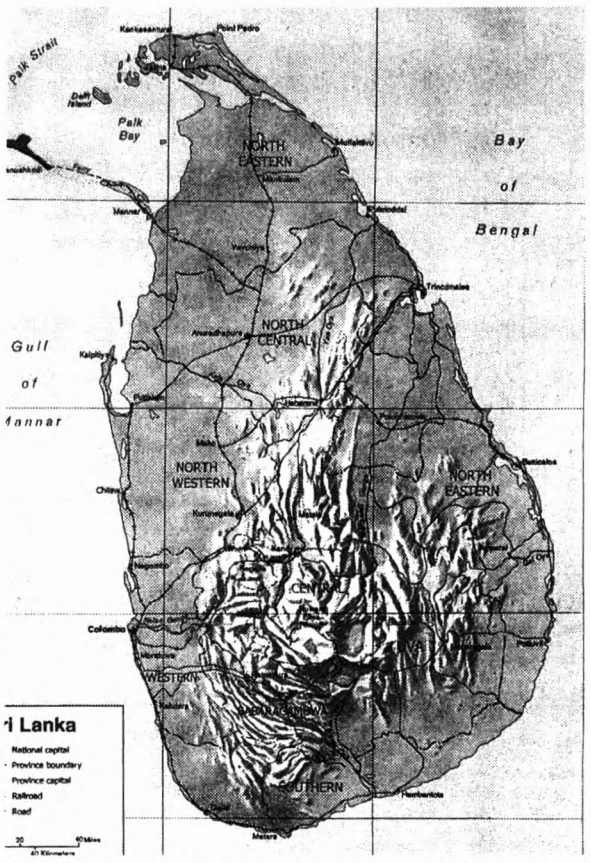
The need to protect fauna and flora is not merely for sentimental reasons but has sound economic advantages. To take the case of the country we know as home – Sri Lanka - the work of scientists working here over the last two centuries has made it abundantly clear that this country is a treasure trove of plant and animal species; of which many are endemic (i.e. not found elsewhere in the world). This gives opportunities for developing lucrative ecotourism business ventures, to which we will return later.

To be more specific about the biodiversity of Sri Lanka, the National Science Foundation publication 'Natural Resources of Sri Lanka 2000' informs us that we of the present generation are the inheritors of 896 spp. (i.e. species) of algae, 1920 spp. of fungi, over 200 spp. of lichens, 575 spp. of mosses, 190 spp. of liverworts, 314 spp. of ferns and fern allies (of which 18% are endemic), 1 sp. of gymnosperms and 3368 spp. of flowering plants. As far as the animal kingdom is concerned, we share this land with 266 spp. of land molluscs (snails etc.; 76 % endemic), 400 spp. of spiders, 131 spp. of mosquitos (13% endemic), 31 spp. of ostracods (36 % endemic), 28 spp. of freshwater shrimps, prawns and crabs (36 % endemic), 368 spp. of ground beetles (34 % endemic), 65 spp. of freshwater fishes (45 % endemic), 48 spp. of amphibians (60% endemic), 162 spp. of reptiles (49 % endemic), 237 spp. of resident birds (8% endemic) and 89 spp. of mammals (13% endemic). The foregoing numbers of species of plants and animals should be regarded as minimum figures as thousands more undoubtedly remain to be discovered and named, as is witnessed by the identification recently of an owl of significant size previously unknown to Science.

Protection is afforded, in principle, to many species of plants and animals by the Fauna and Flora Protection Act and Amendments and other legislation. However, other factors come into play which are gradually (sometimes imperceptibly) working to nullify the good intentions. Consideration of some of these (particularly land use) may help to bring certain aspects into focus. The figures presented in the discussions in this essay were culled from usually reliable sources such as the Annual Report of the Central Bank 2004, Statistical Pocket Book 2004 of the Department of Census and Statistics and 'Natural Resources of Sri Lanka 2000'. However, various respected authorities occasionally present different figures (sometimes due to differences in data collection) so those cited here are for purposes of developing the broad picture for the general public rather than an academic analysis.

The overall land area of Sri Lanka amounts to some 6,552,500 ha (hectares) of which the area of the reservoirs amounts to 130,300 ha. This provides a figure of 6,422,200 ha as exposed land area. Of this, the area of the main urban centres (not including other areas of human habitation) amounts to 25,890 ha. Reservations for roads, railways and other infrastructure facilities account for a further 165,000 ha. The proposed development of a second International Airport will likely impact to some extent on wildlife protection in the vicinity.

Tea, rubber and coconut are not indigenous to the island and cultivations of these exotic species are 210,621 ha, 114,681 ha and 394,836 ha respectively.



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Other exotic species planted to a significant extent include coffee (13,270 ha), maize (20,275 ha), potatoes (2965 ha) and chillies (11,100 ha). (n.b. It is worth noting that in 1873 plantation coffee covered 110,500 ha largely on land previously occupied by indigenous plant species. When the coffee monoculture failed due to disease, it was replaced on these lands with tea.) So-called man-made forests (which are in truth no more than plantations of trees) amount to 91,500 ha, which include exotic species such as pines (16,500 ha) and eucalyptus, which (together with acacia) cover 28,275 ha.

Rice is another major crop where some 600,000 ha may be sown in the Maha season. Various other crops, including sugar cane, oil palm and vegetables of different kinds, are among those which are steadily reducing the extent of land available for wildlife habitat. The total extent of agricultural holdings in Sri Lanka in 2002, being the sum of small holdings (less than 8.1 ha) and estates (of or more than 8.1 ha) has been reported to have been 1,916,210 ha.

Wildlife protection and conservation has traditionally been of official concern in Sri Lanka from the earliest times. King Devanampiya Tissa declared Mihintale a sanctuary following Arahat Mahinda's admonition to him around 247 B.C. as follows:

" O' great King! The birds of the air and the beasts on the earth have an equal right to live and move about in any part of this land as thou. The land belongs to the people and all other beings and thou art only the guardian of it."

In today's monetary terms, the biodiversity can be exploited for upmarket tourism, which can be a goldmine in the years ahead and with far less adverse impacts than mass market tourism evaluated in terms of numbers of arrivals. Areas designated for wildlife protection in 2003 include National Parks (510,079 ha), Nature Reserves (51,606 ha), Strict Natural Reserves (31,574 ha), Jungle Corridors (10,364 ha) and Sanctuaries (312,078 ha) to a total of 915,701 ha. These official figures may be over-estimates (or 'historical' data) in some instances due to encroachments, tree felling activities etc.

Another potential problem looming on the horizon is the proposal to use 'dendropower' to meet part of the country's energy needs. Basically, this entails growing fuelwood to burn for the generation of electricity. The basic concept is very appealing as it includes attributes such as the non-generation of large amounts of toxic wastes, residues and effluents. (However, generation of noise pollution may be a factor.) One of the other important advantages is the independence from foreign fuel suppliers as is the saving of foreign exchange. However, for how many decades village youth would be content to survive on an income obtained by cutting firewood, while their siblings and schoolmates are advancing themselves in the Brave New World of modern technology, is open to question.

Perhaps, the main area of concern as regards generation of electricity using dendropower is the acreage of land proposed to be used. The effect on our biodiversity appears to have been overlooked by the engineers, who have sincerely and devotedly laboured for years to develop this technology in the national interest. The tree species identified to be used is glyricidia (n.b. another exotic) and at a recent seminar on 'dendropower' a speaker observed that 1.2 million hectares of 'waste' land was available for this purpose. This large extent of land may be 'waste' from a human or anthropocentric point of view, but it is 'home' for the millions of the individual plants and animals with whom we share those areas of the country. It would appear to be preferable to cultivate the glyricidia as a supplementary crop on existing agricultural land, such as coconut estates, rather than on 'waste land' if practicable.

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The whole situation is particularly deplorable since we would not have been driven into this extreme position of having to propose squandering 1.2 million hectares or more of our precious land resources to grow an exotic, namely glyricidia, if we had had the resolve to go for coal-fired thermal power at a time when it was becoming patently obvious that we would have to do so at some point. We have been discussing this matter for nearly twenty five years and have finally had to decide to go for it due to the compulsion of rising oil prices and when we are no longer complete masters of the situation. It is to be fervently hoped that in our present extreme situation we do not decide to skimp on necessary built in environmental safeguards.

In the space of the twenty five years that the country has been debating the 'coal-fired power plant' issue, untold fortunes have been squandered on importing oil. In addition, insurgencies and terrorism have broken out fuelled by severe unemployment and under-employment in both the north and the south of the country, which has concurrently acquired a reputation worldwide as a source of housemaids and refugees.

It is of interest to speculate as to how and why it took some twenty five years to come to a firm decision to go for coal-fired power generation. Such self examination could provide valuable lessons to avoid being confronted with like situations in the future.

It was quite clear for years to many observers of the scene that there was no way the country could avoid coal as a major contributor to our energy needs; at least until a usable alternative option, such as solar technology, is available. (n.b. Large scale research on usable solar technology has been impeded for years by vested interests in order to ensure that the last dollar is squeezed out of depleting oil reserves.) The major reservoirs for hydropower (including Upper Kotmale) had been identified and evaluated and would not meet the power and energy requirements, even in drought-free years. Nuclear power is unwise in the hands of a people who lack the self-discipline to run a clean and efficient bus system and, in any case, is inadvisable under prevailing conditions. Windmills, OTEC (Ocean Thermal Energy Conversion), geothermal energy etc are fringe players at best at the present stage of development.

The twenty five year delay in announcing a firm positive decision on the coal option appears to have been driven by a fear of the unknown. Undoubtedly, there would have been those working behind the scenes to block a commitment to this option, wherever it was proposed to be sited; be it at Norochcholai, Trincomalee or down South. The unspoken reasons for this opposition could be one or more of several. These could include the lush earnings made from supplying stand-by power and the political and other benefits of seeing to it that Sri Lanka remains for ever as a depressed (or even a failed) state providing a market for the world's goods paid for thanks to the earnings of housemaids and other manual workers in foreign lands.

However, playing on the fears of the public and of vote-dependent politicians is facilitated by (if not dependent on) all concerned being largely scientifically and technologically inexperienced. It requires at least a basic scientific and technological background for the public, however intelligent, to be able to follow and understand technical arguments and reasons placed before them and to have the confidence to be able to realise when the wool is being pulled over their eyes. Such a scientific and technological background is most easily acquired by individuals with a basic knowledge of English, which will enable them to read newspapers, magazines, journals and books with the required information.

An alternative working scenario is a dictatorship or a one-party system of government where the general populace has no voice in the taking of decisions of this nature. This will need to be addressed elsewhere.