

Some Thoughts on Conservation and Development in Forestry

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With the rapid clearing of natural forests that has been taking place the world over, it is not surprising that there is now a growing and well-informed body of persons which strongly opposes the uncontrolled felling of forests. It is now widely recognized that the continued destruction of natural ecosystems can cause global disasters, such as adverse and permanent climatic changes, large losses of genetic material (both faunal and floral), desertification, and so on. Other more localized deleterious effects are soil erosion, disturbance of the water regime of a region and local climatic changes. So, whereas forests were once looked upon as a storehouse of timber and as unused land available for development, now their intrinsic value in protecting the environment is widely appreciated. For fulfilling this protective function, it is necessary that forests be conserved, while for the production of timber, a very important commodity in the world today, the forests have to be felled. One of the biggest dilemmas the forester, particularly of a developing country, has to face is to reconcile these two requirements which appear to be in conflict with each other.

Major Ecosystems of Sri Lanka

To examine these two concepts, protection of the environment and supply of timber and other products, in the context of Sri Lanka, it is necessary to make a brief reference to the major natural ecosystems in the country. Though it is a small country, Sri Lanka possesses a number of distinct bio-climatic zones, and corresponding to these zones, there are different natural climax ecosystems. In the low and mid-country Wet Zone, characterized by an year round high temperature and a heavy and well distributed rainfall, the climax ecosystem is the Tropical Rainforest or Wet Evergreen Forest. Though once extensive, the area of Rainforest has now dwindled to about 250,000 acres in a land area of about 3 million acres.

In the Dry Zone, that broad and extensive peneplain covering about 5/8 of the land area of the country, the natural climax ecosystem is the Dry Mixed Evergreen Forest. In certain parts of the Dry Zone, notably in Bibile, Ekiriyanakumbura and Amparai, there are large tracts of savannah vegetation containing scattered fire resistant trees (Aralu, Bulu, Nelli, Kahata, etc.) with a thick undergrowth of the inflammable grass, Illuk. The Dry Mixed Evergreen Forest is not primeval in the sense that, for example, parts of Sinharaja forest of the Wet Zone are, for in centuries past, almost all of the Dry Zone had at one time or another been under agriculture, and the Dry Mixed Evergreen Forest that had since developed is the product of the slow, natural succession after the cultivations were abandoned.

At the beginning of this century, the Dry Zone was extensively covered by forest. Selective exploitation

of the better species (eg. Satin, Halmilla) was being carried out to supply timber for local consumption and export. In the last few decades, selective exploitation was intensified, and shifting cultivation and the opening up of land for settlement and agricultural development projects increased sharply. These activities have made severe inroads into the Dry Zone forests, and it is doubtful whether today there is even a million acres of reasonably good natural forest in this zone. But if the areas of very low quality forest, the scrublands and the abandoned chenas are aggregated, they would together make up over double the extent of high forest. The degradation of the original forest ecosystem and its replacement by scrub, etc. is due to human activity.

In the wet region of the highlands, the highforest climax ecosystem has been preserved over relatively large areas, notably in the Forest Reserves of Pidurutalagala, Peak Wilderness, Agra Bopatalawa and Kikiliyamana. It was mainly because of an edict passed in 1850, that no forests at elevations of over 5,000 ft should be cleared that many of these upcountry forests remain to this day. These forests situated as they are in the highest elevations of the country are extremely important for protecting the watersheds of the major rivers.

Three major ecosystems of Sri Lanka have been referred to above. Natural climax ecosystems such as these have a vital role to play in maintaining the stability of the environment. These ecosystems represent the balanced interaction between the biota (living things), the edaphic (soil) factors and the climate. When natural disasters strike and disrupt these systems, equilibrium is generally restored again in a few years. But man's activity where he has cleared enormous extents of forests in pursuit of development and carried out shifting cultivation and selective exploitation at an alarming rate particularly in the tropics, can in no way be compared to natural disasters. Such activities cause irretrievable damage to natural ecosystems over large areas. Here in Sri Lanka, uncontrolled clearing has resulted in the degradation of what were once highforest into scrublands, grasslands and other such inferior vegetation types. This type of misuse of land has alerted us to the imperative need to conserve what is left of our natural forests. How then does the forester solve the problem of retaining the forest or, rather, what is left of it, for protecting the environment on the one hand and exploiting it for the production of timber, fuelwood, etc., on the other? It must also be remembered that, in preparing his programme of action, the forester has to work within the limitations imposed by natural and economic factors.

Natural factors like climate and soil will determine the growth and reproduction of species, while economic factors will determine the financial limits to which the forester could go in planning his forestry activities.

Current and Future Strategies

By forest conservation we do not mean the absolute protection of the forest (except in very limited areas). Conservation, if it meant absolute protection, would be a very sterile concept, and forestry would have no place as a profession, for all that would be required of a forester is to police the forest. The essence of forestry is to manage the forests in such a manner that they would be of optimum and sustained benefit to society. The forester trained in all the multifarious facets of forestry (silviculture, utilization, forest protection, soil science, forest economics and so on) has to strike a balance between the optimum benefit to society, both through protection of the environment and production of timber.

What broad strategy should the forester adopt in regard to forestry conservation and development in Sri Lanka? Let us take in turn the three climatic zones referred to earlier. In the low country and mid country Wet Zone there are at present about 250,000 acres of natural forest in scattered blocks, situated mostly in steep and inaccessible terrain. Since this area represents only a very small percentage of the land area of the region, and as the region is susceptible to environmental hazards like floods and soil erosion, it is absolutely necessary that this small extent of residual natural forests be retained as such without being given over to any other form of land use. However, this does not mean that the entire area of 250,000 acres should be left untouched as a 'nature reserve'. Our country cannot afford this luxury. Except for certain clearly defined areas which could be absolutely protected, controlled felling could be carried out in the rest of the area. The system of timber harvesting adopted in the Wet Zone natural forests, ideally consists of the felling of trees individually selected for their size (as an index of maturity) and utility value. In this way, no more than 2 or 3 trees are felled per acre. Suitable silvicultural operations will also have to be carried out to obtain regeneration of the better species in preference to the inferior ones. In this method of forest management (practised to perfection in Switzerland), the forest will never be laid bare at any time.

The natural forests of Sri Lanka, particularly those of the Wet Zone, contain a large number of species of plants that are endemic to the country (i.e. found nowhere else in the world), and it is of the utmost importance that forestry practices should in no way threaten the extinction of any such species. Certain areas of natural forests (including a good part of Sinharaja), have therefore been set apart as absolutely protected reserves where no human activity of any kind is permitted.

In the Wet Zone, there is also an extent of about 200,000 acres of derelict land (in scattered areas) that was once under forest but is now under grass, fern or scrub. Most of these lands are unsuitable for permanent agriculture, and are now unproductive except for sporadic grazing by a few head of cattle or the occasional cultivation

of small plots mainly with manioc. The bulk of this area is therefore available for forestry development, and an intensive reforestation programme, mainly with *Pinus caribaea*, is being carried out. The *Pinus* plantations are intended primarily for the paper industry. *Pinus*, like Teak and many other species used for reforestation in Sri Lanka, is not a plant that is indigenous to the country. The forester is often taken to task for selecting exotic species for forestation in preference to indigenous ones. The question may be asked like this: "The indigenous forest trees grow majestically in the natural forests so why select other alien species for reforestation in preference to the well adapted local ones?" A brief reply to this query will be attempted here but the author has given a more comprehensive answer in another paper.*

What is not often appreciated is that the Tropical Rainforest, evolved over millenia, and forming such a rich and complex ecosystem, is nevertheless a very delicately balanced system. The soils of regions such as the Wet Zone of Sri Lanka are inherently poor in plant nutrients, and the forest is sustained by a rapid absorption of the plant nutrients released by the decay of plant and animal debris. If such a forest is felled and the area chena cultivated, in two years or so the soil would have lost all the nutrients received from the chena burn, and in this impoverished site the trees of the highforest cannot get re-established. Hence, for reforestation of such sites, species that tolerate the degraded conditions will have to be selected. *Pinus caribaea* is one such species, and it is propagated widely in tropical regions. Admittedly, from the environmental and aesthetic point of view, it would have been preferable to have retained the natural forests, but once these are destroyed, raising forest plantations of adaptable species is better than allowing these areas to remain in their derelict condition.

Turning our attention to the Dry Zone, this is the region where there will be maximum development of both agriculture and forestry in the future. It is estimated that the area of forest and scrubland in the Dry Zone is about 40 per cent of the land area of the Zone. A good part of this area will be used for development within the next decade or so, and not more than two to three million acres will eventually be available for permanent forestry. Since the nineteen fifties, it has been increasingly realized that the natural forests of the Dry Zone, which had at one time held the wealth of the timber resources of the country, would not be able to continue to serve our timber needs other than to supply a small fraction of the demand. Hence the reforestation programme that was going on at a minuscule scale was rapidly expanded. At present, the rate of reforestation in the Dry Zone is 15,000 to 20,000 acres each year, two-third of the extent being in Teak. Almost certainly the rate of reforestation with Teak will be increased in the future (despite the temporary problem caused by the widespread destruction of Teak plantations by elephants), and the present plantation estate of about 160,000 acres will be greatly expanded within the next few decades. The production from the plantations will

be quite substantial. An indication of what could be expected is seen from the large stocks of Teak that have reached the market only from trees — most of which are well below optimum size — damaged during the 1978 cyclone.

With his preoccupation with reforestation in the Dry Zone, the forester should not lose sight of the importance of retaining adequate areas of natural forest in the region. Without question, these natural forests are more effective than plantations for conserving soil and water and stabilizing the environment, and moreover they are needed for protecting the indigenous gene pool. Eventually, it is expected that about 1.5 to 2 million acres (including the areas of the National Parks) would be retained in natural forests in the dry Zone.

The Montane Forests are best retained as such for environmental protection. However, limited extents have to be felled to supply the firewood needs of the area (including the demands of the tea factories), and the areas so felled are planted with high-yielding firewood species. But apart from the natural forests of the Montane Zone, there is considerable scope for developmental forestry in other areas of the upcountry and midcountry region. The Montane Grasslands or Patanas where there is little or no indigenous tree growth are excellent for afforestation with species of *Pinus* and *Eucalyptus*. Besides forming shelter-belts so badly needed in the Patana grasslands, the plantations established on the Patanas are highly productive (timber, fuelwood and pulp wood). In addition to the Patanas, there are large tracts of derelict and totally unproductive tea plantations and these, too, are being transformed into plantations of great potential value.

The current forestation programme, though considered adequate when it was drawn up some years ago, now needs to be expanded. One of the areas that received very little attention in national forestation planning in the past, is the question of fuelwood supplies. That this should have been so despite the fact that over 90 per cent of households and many industries (eg. tea, bread, bricks and tiles, tobacco, etc.) use fuelwood, is due to the fact that the organized supply of fuelwood from State forests account for only a very small fraction of the demand. Rubberwood (from rubber estates being taken up for replanting), trees from private lands, agricultural residues and unrecorded collection from the State forests make up the vast bulk of the fuelwood that is consumed. Recently, two factors have brought into sharp focus the question of fuelwood supplies. One is the world fuel crisis which has, in Sri Lanka, dispelled any possibility of a mass scale switchover from fuelwood to oil. The other is the rapid depletion of natural forests and the largescale settlements associated with the Mahaweli Project, which will require that an organized fuelwood resource be built up in an area where once the collection of fuelwood posed no problem. A national forestation programme for fuelwood production is therefore a matter of the greatest urgency, and it is in fact being accorded high priority by the authorities concerned.

Conclusion

It is important that the public should understand and place in the correct perspective the role of forestry in national development. This is all the more important as, unlike in the case of agriculture, the continuing benefits that society derives from sound forestry practices are not easy to appreciate fully. It is with this in mind that I have briefly outlined some of the criteria and strategies in regard to conservation and development in forestry.

