

CHAPTER 2

HISTORICAL DEVELOPMENT OF FOREST MANAGEMENT

2.1 Introduction

Sri Lanka provides a very interesting case study in the development of forest management, for two reasons:

- it has a long history of forest management, under varying social conditions;
- forest management has been relatively well-documented throughout most of this period.

Since people first began to impact on the forests over two thousand years ago, three phases in the evolution of forest management can be recognised:

- pre-colonial;
- colonial;
- post-colonial.

Although it would be unfair to state that each had absolutely unique ways of managing the forests, there are nevertheless good grounds for considering them as quite distinct periods in Sri Lanka's history, and this document follows such a path.

2.2 The pre-colonial period

Sri Lanka is famous for its home gardens, which represent a form of management of forest or agroforestry that goes back many centuries to the early days of the Sinhalese culture. References to the management of such forests and home gardens have been recorded in the Sinhalese chronicles of Sri

Lanka, including the Mahawamsa, the Rajaratnacari and the Rajavaliya, and as stone edicts by the Sinhalese kings. These edicts often place a major emphasis on forest conservation.

The “policy”, if it can be called that, to conserve forests was to a great degree influenced by Buddhist philosophy which inculcates in man a love for trees, wildlife, forests and nature in general. To quote from Gautama Buddha:

"the forest is a peculiar organism of unlimited kindness and benevolence that makes no demand for its sustenance and extends generously the products of its life's activity. It affords protection to all beings, offering shade even to the axeman who destroys it."

This quotation is now the preface to *The Sri Lanka Forester*, the journal of the Sri Lanka Forest Department.

In order to appreciate the historical development of forest management practices in Sri Lanka, it is necessary to have some idea of what forestry practices were prevalent in ancient times during the periods the country was ruled by Sinhalese kings. Box 2.1 provides some examples taken from Sri Lanka's recorded history (Geiger, 1912; Nanayakkara, 1987; Ainslie, 1920; Vincent, 1882).

Box 2.1

References to forestry under the Sinhalese kings

- 543 B.C – King Vijaya: During the time of King Vijaya, social tree planting practices were common, village communities were well organised and home gardens were planted with flowering and fruit-bearing trees.
- 247 to 207 B.C – King Tissa: There are records of forests being used for meditation by Buddhist monks, and that wildlife was protected.
- 161 to 137 B.C. – King Dutugemunu: rules for forest protection and for the use of forest products had been drawn up, and forest plantations raised.
- 1187 to 1196 A.D – King Kirti Nissanga: During this period there are descriptions of the protective role of the forest from a military standpoint.
- 1284 to 1310 A.D – King Parakramabahu the Great: There are references again to the protective role of the forest, and how soldiers sojourned inside the forests and defeated the enemy.
- 1373 to 1406 A.D – King Buvenekabahu V: Forest officials had been appointed, and forests granted to people for services performed for the King or State.

According to Ainslie (1920), Sinhalese kings appointed Forest Officers, whose duties were largely confined to providing game and fruit for the Royal household, to the prevention of poaching, the protection of royal trees, and the settlement of land claims. Therefore, although the present relationship of the state to the forests is very recent, it can be seen as being the direct result of the past history of the forests. In the time of the Sinhalese Kings and before the arrival of the Europeans, the King of Sri Lanka himself was generally considered to be the owner of the forest lands, but from time to time large grants of these lands were made to individuals, and to various Buddhist communities and so on. Some of those grants still hold good.

In the mid-seventeenth century, Knox (1681) referred to the existence in the Kandyan kingdom of extensive dense natural forests, and to the carefully protected and managed dense forest belts that served as boundaries of districts, and which were protected for security purposes. According to Vincent (1882), the protective belt around the Kandyan Kingdom was 30 to 40 miles wide. This belt of forest, which protected the Kandyans so effectively, is no longer traceable, and the area occupied by it is now largely given over to *chena* (shifting) cultivation.

Although it is tempting to think of the pre-colonial period as one in which people lived in harmony with the forest, this is probably a simplistic view. As time went on and the Sinhalese civilisation reached its zenith (with palaces and complex irrigation systems, for example), demand for land and resources inevitably increased. It seems likely that laws and edicts passed at that time would reflect this situation. Indeed, it could be argued that they would not have been necessary if the forest resource had not been under some kind of pressure.

Furthermore, whilst in the nineteenth century the British found most of the island to be forested, much of that forest may have been relatively young. According to Vincent (1882), a large part of the forests existing then were but a secondary growth which sprang up on the disappearance of a large population, some time between the 8th and 12th centuries. Yet in the 13th century, during the reign of the monarch Parakramabahu the Great, the country is said to have boasted a population of 30 million, perhaps suggesting that forests were not a hindrance to, but supportive of, a healthy and prosperous living for a large population. If this figure of 30 million is to be believed, and

if at the time much of the country was forested, then it suggests that the forests were being managed in some rational or scientific way. Whatever the real situation, it seems likely that human populations fluctuated dramatically, and were sometimes high, even by today's standards. The only assigned causes of sudden depopulation are frequent Tamil invasions and massacres, or disease. As a result Sinhalese culture, built on the tenets of Buddhist philosophy, was also gradually eroded and as it did so, forest cover may have started to decline.

One example of the effects of depopulation can be seen in the ancient irrigation networks that once criss-crossed the dry zone plains, and to some extent still do. These supplied water to farmlands which were available for cultivation throughout the year. Linked to these were highly productive home gardens carrying a bewildering array of timber, fuelwood, fruit, fodder, medicinal and multi-purpose trees. Many of these areas have now reverted to dry monsoon forest and scrub, and have only begun to be re-colonised in the last few decades as populations have risen again.

2.3 The colonial period

Forest management under the Portuguese and Dutch, 1500s to 1815

The Portuguese and Dutch only ruled maritime parts of Sri Lanka. Reference to forest management practices during these administrations are scant. During Portuguese times, it is known that large-scale cutting and export of coastal timbers and spices took place. During the Dutch maritime administration, valuable timber like calamander and ebony were exported to the Netherlands with the connivance of local people in the hinterland. Traditional forest management practices in the Kandyan kingdom continued until the arrival of the British.

Forest management under the British, 1815 to 1948

Early exploitation and clearance of forests

Forest management under the British reflected the changing needs of the colonial authorities, as well as the sociological changes that colonialism brought to the islanders.

Large-scale forest clearance in the central montane zone was undertaken by the colonial administration after Britain annexed the country in 1815, first for its own security and then for the planting of coffee and later tea. Forest clearance was stepped up after the unsuccessful Sinhalese rebellions of 1818 and 1848.

Forests in the lowlands in the wet zone were also cleared for planting rubber and coconut. As a result, the cleared hills started to erode, frequently resulting in soil loss and floods. In addition, valuable tropical hardwood timbers continued to be cut and exported from the country's southern forests, in a continuation of what was started by the Portuguese and Dutch. Partly as a result of this intensification of activity in and around the island's forests, and the ensuing sociological change, people who had been accustomed to living a relatively healthy and prosperous life as farming communities in forested regions began to become more and more impoverished or alienated from the forest.

One result of this turmoil was the spread of *chena* cultivation. People resorted to it in order to subsist under repressive conditions, or in order to make a living under conditions of expanding human populations. This resulted in further loss of forest cover.

Hence, the earlier scenario, in which a certain amount of forest conservation had been part of the culture, now turned into one of wholesale forest denudation. Until the latter part of the 19th century, the British colonial administration did not seem to be aware of the need for forest management in the sustainable exploitation of the country's natural resources; indeed, there was little concern for sustainability at all.

However, the rational exploitation of the timber, reflected in the adoption of felling rules in 1835 and a timber-cutting licence and management system in

1879 indicated a change in approach. There was also an Ordinance of 1848, allowing the declaration of Forest Reserves, although it was not until 1890 that the first Reserve (a small area of some 800 acres in the wet zone) was proclaimed. The enlightened British forester Ainslie has put it like this:

"In 1873, a few totally unqualified men were appointed 'Foresters' and worked under the supervision of the Government Agents. In those days, however, the raison d'être of the forests was felt to be exploitation only, and as a system of "share and share alike" had been introduced, the over-exploitation resulting from the practically unrestricted co-operation of a contractor eager to make money, and a Government official equally eager to make revenue, can be better imagined than described. It is safe to say that during this period the greater part of the remaining dry zone forest was silviculturally ruined for at least half a century." (Ainslie, 1920).

This is not to say that some individuals were not concerned about the damage to the forests. For example, in 1873, the British naturalist Joseph Hooker strongly advocated the conservation of forests above 5,000 feet for environmental, soil and water conservation reasons. He proposed that Climatic Forest Reserves should be reserved on mountainous and other critical areas. It was, however, a recommendation which unfortunately did not pass into legislation, and deforestation in these highlands continued to provide more space for tea plantations.

Along with deforestation, the deliberate decimation of wildlife commenced in this period, sometimes on what today would be considered a vast scale. For instance, a British hunter and explorer called Samuel Baker is said to have killed almost all the forest elephants in the Moon Plains plateau in the montane zone, as well as in some lowland forest areas in the East (Baker, 1855).

Rationalisation of exploitation and the first signs of forest conservation

Some sort of enlightenment eventually came in 1887 when, realising the need to curb further forest denudation and to start forest management, the British colonial government appointed a Conservator of Forests for the whole country

(Nanayakkara, 1987), whose duties included establishing a Forest Department. Hence, there began again a trend towards forest conservation and an approach to scientific forest management. Despite the fact that the forests in the vital watersheds of the montane zone had been ravaged, the country still had, in 1881, an extensive forest cover of about 84%, mainly in the dry zone, and this had only been reduced to about 70% by the turn of the century. Unfortunately, from a modern planning point of view, the distribution of the remaining forests was far from ideal. Many of the remaining forests were likely to have been secondary forests that grew on abandoned areas where the old Sinhalese civilisations had flourished, and were therefore likely to be on good agricultural land. Meanwhile, many of the important watershed forests of the mountain areas, and other forests on steep slopes, had been cleared to make way for extensive cash crops like coffee and tea.

Thus, by the end of the nineteenth century, the approach to forest management under the colonial administration had begun to shift, from one that allowed over-exploitation and encouraged shifting cultivation, towards scientific forest management and conservation, in what was a difficult attempt to stem the tide of deforestation. The credit for this change in thinking goes to the enlightened British foresters and naturalists who arrived in the country at this time. On their advice, which in turn reflected an empire-wide change in thinking about forest management, the District Administrators framed legislation to enable the declaration and demarcation of Forest Reserves or Proposed Reserves in order to protect forest cover. Despite this, timber continued to be felled indiscriminately on licences which were rarely checked. Most of the timber found its way to Europe, and the rare timber, calamander, became virtually extinct.

One problem at this time was that there was no official forest policy to guide the colonial administration in forest management. This kind of forest administration without a policy and without supervision soon got out of hand and came to the notice of the British Auditor General who made proposals to improve forest management in the country.

Forest management under the Forest Department

In 1899, the newly-formed Forest Department assumed responsibility for forest management in all forests, except in some less valuable provincial forests

which continued to be managed by the District Administrators until 1904 when all the island's forests were brought under its control. The duties of the Forest Department were the conservation, protection, and systematic management of the State forests in order to produce a sustained and permanent yield. To achieve these objectives, a straightforward working circle system of management was established, with the whole country divided into six working circles. This later changed to five and then seven forest divisions, subdivided into ranges and beats. A new Forest Ordinance was brought into being to cover protection and management of the entire forest estate of the country.

The damaging effects of earlier exploitation of the forests took many years to subside. Although in 1920 it was reported that the forest cover was still high, very little of it was marketable timber (Ainslie, 1920). But with the progressive introduction of regeneration fellings and proper sustained yield timber management to ensure highest productivity, under the supervision of qualified foresters, the marketable timber stock gradually increased again.

Forest management activities were strengthened by the promulgation of a new Forest Policy in 1929 (revised in 1953, after independence). These policies continued to emphasise the sustained yield of timber, but were weak in that the importance of forests in the overall improvement of the environment was not a principal consideration, and there was no mention of any participatory aspects in forestry development. This was not surprising, because the country still had a high forest cover and did not yet feel the pinch of a timber shortage, even though in many forest areas the volume of stock continued its downward slide.

On the credit side, apart from the decisive action taken to conserve and manage the forests on a scientific basis, the Colonial Government had considered it necessary to grant free collection rights to the now poor rural people to collect fuelwood within a three mile radius of their villages if located near or within forest areas.

In 1933, on the advice given to government by Champion, forest management took on the system of management through classical scientific Working Plans, and both selective felling and selection felling forest management practices were introduced in different forest areas. Forest inventories were initiated by the Forest Department to determine the existing forest stock. Research began

on how to regenerate these forests to ensure sustained out-turn in perpetuity and the rate of growth, and hence the permissible rate of exploitation (Champion, 1936; 1957). Selective fellings in the early stages were confined to trees over six feet in girth. Although this may have been considered the correct approach to forest management, in 1934 sustained yield forest management received a set-back when forest administration was fragmented again by the transferral of "other crown forests" to the Government Agents running the District Administrations.

Plantation forestry was also begun on *patana* grasslands and by conversion of natural forests in the montane dry and intermediate zones, necessitating the writing of Working Plans for their management as well. Species planted were mainly teak, *Pinus*, eucalypts and *Artocarpus* (jak), as well as mahogany and *Albizia*. Forest plantations were at first managed under what were called "schemes", but these were ineffective and only good on paper. The first ten-year Working Plan for the montane plantations was prepared in 1915, before Champion's advice (of 1930), and was for eucalypt plantations to meet the specific demand for wooden railway sleepers and some utility timber. Later, a form of selection system of management was adopted for a dense canopied mixed plantation forest block rich in timber, the Sundapola mahogany/jak plantation in the north-west intermediate zone, using two Working Circles – a Uniform Working Circle and a Mixed Selection Working Circle. A Working Plan Management System for the growing montane forest plantations was prepared in 1938 and revised twice subsequently.

During World War II, Working Plans prescriptions could not be adhered to and forests were overcut for the war effort.

2.4 The post-independence period

Introduction

The optimism that took hold following independence produced a change of outlook amongst those in control of the country's resources, with major ramifications for the forests and forestry. The national thrust became "development" in which forests were to play a part but not necessarily the part

for which the Forest Department had been prepared. Development meant different things at different times. Sometimes it involved trying to get more from the natural resources through intensification of management (although sometimes without the qualified manpower to do the job); at other times it meant subjugating natural resource management for what were seen as more prestigious or economically important development activities.

Evolution of Forest Department activities to suit changing needs

From independence in 1948, the Working Plans system of forest management was extended to cover forests in most of the Forest Divisions. This was in keeping with the greater need for forest protection and the need for timber and other forest products to meet the needs of an expanding population. The Working Plans were for fixed periods, to be revised regularly. This period in Sri Lanka's history saw forest management planning moving from emphasis on a single resource (timber) to emphasis on multiple resources and, as a result, responsibilities have evolved from custodianship to intensive integrated management (Sahajanathan, 1987). In the revised Forest Policy of 1953, reforestation, conservation of water, and the preservation of indigenous fauna and flora were given high priority, but the export of high value timber was still encouraged. In 1958, the "other crown forests" were handed back to the Forest Department and sustained yield management suffered again: timber yields could not be sustained because forest administrations changed hands frequently, records were lost and forest staffing was inadequate to carry out Working Plan prescriptions.

This new approach to forest management took the form of all management planning and operations being in the hands of the Forest Department (Box 2.2), based on the Champion recommendations which were also being applied at that time in India and Burma.

The preparation of scientific Working Plans was a slow process because of staffing problems and some government-instituted intrusions into forest areas in the form of *ad hoc* excisions for purposes other than forestry. Nevertheless, the classical forest management approach that was prevalent at the time of independence was continued, and included both natural forests and plantations. For instance, Working Plans for the dry zone and intermediate zone teak plantations were prepared in 1956. The Working Plans systems of sustained

yield management remained in vogue for decades, and were only replaced recently by Management Plans prepared under a system of strategic forest management planning.

In the early 1960s, zonal management of forests was tried, the zones being defined on a geographical basis. However, this experiment was a total failure, because of inadequate infrastructure and ignorance of basic forestry principles. Within half a year the “zonal system” was abandoned.

Box 2.2
Early post-independence
approaches to forest management

Wet zone forests

- Coppice Working Circle, for fuelwood and small poles, with a 25-year rotation, to supply different centres of consumption.
- Clear felling Working Circle, for fuelwood and timber and subsequent planting. This was primarily of an experimental nature around ‘*chena*’ reforestation areas in small annual coupes.
- Local supplies Selective Working Circle for timber.
- Railway sleeper supply Working Circle. The recommended felling was on a selection system with an exploitable girth for *Dipterocarpus zeylanicus* (Hora) at the same 6ft level, on a 20-year felling cycle.

Dry zone forests

- Selective Working Circle for timber on a 40-year felling cycle.
- Conversion Working Circle with several felling series for locations suited for growing Teak where *chena* reforestation could be done effectively.

Montane forests

- Growing of general utility timber on *patana* grassland afforestation areas, rather than specific purpose timber.
- Continuation of tea estate fuelwood plantation coupes.

Development brings changing fortunes for forestry

Despite all these increasingly scientific approaches to forest management, forest denudation returned. The reasons for this included not only rapidly

growing human populations with growing needs and aspirations but also the implementation of giant irrigation, settlement, hydro-power, export agriculture, tourist hotels, and shrimp farming projects. Military and terrorist activities also played a part.

The first such project was the Gal-Oya Development project in the Eastern Province. The most recent major project was the massive Mahaweli Development project which, in the 1980s, caused the loss of 243,000 ha of forest, including both teak plantations and natural forest. Nearly 809,000 ha of forest have been lost in the name of development since 1948, resulting in a steep decline in forest cover. More forests were also lost because of continued "irreversible *chena*" cultivation and illegal felling. Moreover, after Mahaweli, State forest clearance for development declined, and regrowth has been recorded.

As the general interest in forestry grew, further forest inventories were carried out, in 1956, 1965/68, and 1979/85, to take stock of the fast-depleting forest resource and to prepare forest resource development plans. Forest inventories cost a lot of money but fortunately, a fair amount of foreign funding was forthcoming since they were considered by donors to be a high priority activity.

The 1956 Inventory was undertaken with assistance from Canada through the Colombo Plan technical assistance programme (Andrews, 1961). The inventory report showed 44% of closed forest cover and contained recommendations to establish management units and the preparation of management plans for these units. Details of compartments, demarcation, annual coupes, short-term cutting plans and road plans were built into the inventory. This was a comprehensive inventory with a new approach to forest management. The allowable cut was a surprising over-estimate of 850,000 m³/yr along with a still surprising recommendation that only 25% of the country be permanently dedicated to forests. This was a common approach to development at the time which emphasised rapid conversion of natural resources into financial assets so as to boost economic development. Fortunately for the forests, this recommendation was not accepted, and the thinking today is that the country should have one third of its area under closed forest cover. One output of the inventory was a good forest type map for the whole country.

By 1965, the Government was faced with conflicting and competing demands for land use. There was also, by then, a policy decision to develop industries based on sustained supplies of forest wood. This resulted in the FAO/UNDP survey and inventory of selected forest areas including forest plantations. The 1956 data were updated with amendments to the inventories of the wet zone and the montane zone plantation forests. The survey showed that with the correct management, the country could enjoy for all time, an adequate supply of forest produce (mainly timber) and a protective forest environment. The expansion of forest plantations in the dry and montane zones was recommended, as well as the expansion of timber supplies through selective logging.

Another result of this survey was the breakaway in 1968 of the timber supplies, conversion, marketing and timber sales activities from the Forest Department, with the formation of the State Timber Corporation. However, this development also ran into difficulties as it did not foresee the oncoming threat to forests in the form of more large-scale development projects such as the Mahaweli. Thus, although inventories should lead to sound management systems, in Sri Lanka the inadequacy of institutional links between development and conservation agencies made it difficult to prepare implementable management systems. Another reason is lack of scientifically-informed political will. These constraints reflected the need for a broad-based National Planning Council with all relevant institutions represented on it at the highest level. In this the importance of forestry was recognised and the voice of concerned foresters and naturalists heard.

Reassertion of forestry as a tool of development, and the growth of conservation awareness

The post-1979 period saw many forestry development projects being implemented, and new thinking emerged on how best to expand forestry activities. Paradoxically, this was also the period of the Mahaweli Development project which saw the clearing of large tracts of forest.

The third forest inventory began in 1979/80 with FAO/UNDP assistance (FAO, 1987). The inventory found that the percentage of closed forest cover was, by 1983, down to about 25% (corrected to about 26% by a later forest cover

monitoring project). It also found that natural high forest, forest plantations over five years and scrubland totalled 37.5% of the area of the country (Sahajanathan, 1987). The all-island deforestation rate, including Mahaweli forest loss, was around 42,000 ha per year. Furthermore, the inventory found:

- a significant proportion of over-exploited natural humid forests;
- non-stocked fallow lands that could be made productive;
- unmanaged forest plantations giving low yields.

The results of this inventory, and the trend in deforestation revealed by it, led to the start-up, in 1983, of the Forest Resources Development Project (FRDP), funded by the World Bank, Finland and Sri Lanka, and the Master Plan for Forestry (Poyry, 1986), both directly attached to the Ministry of Lands and Land Development. New thinking and new approaches emerged as to how forests should be managed in the future, but not all met with approval from foresters and forest scientists.

The Master Plan, which ran into widespread criticism, indicated that intensive exploitation of forests was needed, especially in the dry zone, and that adequate timber could be made available. The Plan had earlier proposed (in its draft) the importation of a large number of sawmills and other expensive equipment to do the chopping and cutting.

Almost all environmentalists, many respected senior university academics, members of the public and the Forest Department itself criticised these proposals. The Plan, even in its final form, had not paid due attention to environmental considerations and conservation of genetic resources which were considered essential by so many people at the time, and which were key components of the Forest Policy. This policy (Section 2.4.5) identified the need “*to maintain, conserve and create forests for the preservation and amelioration of the environment*”, and “*to involve the local community in the development of private woodlots and forestry farms through a programme of social forestry*”. Critics of the Master Plan were of the opinion that the undue emphasis on timber exploitation was due to the agendas of the donor agencies.

The Master Plan made the assumption, which has not gone unchallenged, that deforestation in the dry zone (which carried most of the country’s remaining forests) was inevitable and that it would also gain momentum. That was

apparently also one of the reasons for the proposed importation of the sawmills and equipment: the mills were to expedite this inevitable process of forest denudation. Some of the sawmills that were to have been imported were mobile lumber harvesters, small in size but with a high capacity because they could readily be transported from one forest to another. These mobile harvesters could, in the long run, do more damage to forests than the larger static sawmills.

A close scrutiny of the dry zone forest cover today proves that the Master Plan had made a grave and erroneous assumption. Latest reports indicate an increase in new natural forest growth in some dry zone districts, not a decrease. Fortunately, local protests were supported by an FAO study, and the proposed importation of sawmills was removed from the Master Plan, but the absence of strategies for environmental improvement and conservation of genetic resources remained. Another criticism of the Master Plan was that it was a plan without a plan, there being not a single map to indicate at least the forest management areas.

Despite these criticisms, some useful studies emerged during this period. Two of especial value were a study on demand and supply of timber and fuelwood, and a study on non-forest wood resources. The latter determined that only 50% of timber and 20% of fuelwood consumed in the country came from forests proper in 1986, while the remaining 50% timber and 80% fuelwood came from the country's large tracts of non-forest vegetation, including industrial plantations such as rubber and coconut, as well as home gardens and miscellaneous plantings. Within such a situation, the management of non-forest wood resources should go parallel with forest management. Further, by a logical increase in and management of non-forest areas, the pressure on the remaining forests would be reduced. By complete utilisation of the "lop-and-top" from non-forest trees, the fuelwood yield from non-forest areas could also be increased. Management approaches with this strategy in mind are now gaining ground. Many governmental and private sector agencies would have to be involved in the management of these non-forest wood resources.

The FRDP was followed by the Forest Sector Development Project (FSDP) in 1990 with added funding and technical assistance from the British ODA, UNDP, FAO and IUCN. The FSDP is on-going.

The National Forest Inventory and the two Forest Development Projects paved the way for a new approach to forest management. Computerised management planning was being developed for forests on a district-by-district and a plantation-by-plantation basis. The Forestry Planning Unit (FPU) of the Ministry in charge of Forestry (initially the Ministry of Lands and Land Development), which also had the task of supervising the projects, was responsible for the development of this management system. The foreign-funded components of the FSDP are being supervised by the FPU. They are:

- Environmental Management
- Forest Management
- Silviculture
- Education and Training
- Research and Information
- University of Peradeniya – Oxford Forestry Institute Link
- Institutional Development

Forest Management is the key component and a continuation from the FRDP.

The 1980 National Forest Policy

Introduction

The guiding principles for the National Forest Inventory for forest management planning, the FRDP, the Forestry Master Plan and the continuation FSDP, was to be the 1980 National Forest Policy (Nanayakkara, 1981). Forest management policy was now being considered under three broad areas:

- (i) The management of productive and enriched natural forests;
- (ii) The management of plantation forests;
- (iii) The conservation of natural forests.

However, forest management suffered a setback in the late 1980s. This time it was the socio-political problem that took the form of violent insurgencies.

Insurgencies in the south and the north of the country did not permit entry into forests by foresters and forest workers. The southern insurgency ended, but

the one in the north continues. Non-entry into the southern forests, however, had its good points because it drove unscrupulous timber contractors and illicit fellers out of the forest through sheer fear of the consequences if they entered. Labels affixed to trees in forests of the south carried the legend that timber fellers and forest trespassers would be “dealt with”.

Management of productive and enriched natural forests

The 1986 Natural Forest Inventory report identified 23 management units in the wet and intermediate zones, including the mahogany-enriched forests. A model management plan for one group of natural wet zone forests (the Delwala-Walankanda-Madampe group in the south west wet zone) was prepared with an operational plan, and a modern forest management system emerged. This management system included provision for close monitoring of several components of forestry, including:

- annual coupe area locations;
- road building plan;
- boundary line demarcation;
- reafforestation of unstocked areas;
- enrichment planting with mahogany and dipterocarps;
- establishment of sample plots for monitoring growth and yield.

Management felling prescriptions are on the basis of a selection system of management. All lands coming within Management Plans would be permanently demarcated on the ground, permanently dedicated to the cause of forestry, and managed on a sustained yield basis.

Management of plantation forests

Management plans for plantation stands were prepared with prescriptions for volume production, timing of thinnings and final felling per type of site/growth index class. The computerised Forest Management System (FMS) was built and made operational. It incorporated programmes for yield prediction based on provisional yield tables for each plantation type and site/growth class. Each plantation stand is registered in the system (Sahajanathan, 1987).

Unfortunately, these plans appeared to be more weighted towards wood production. The beneficiary would be the State Timber Corporation which carried out all harvesting operations through contractors or its own logging units. The State Timber Corporation, although well-conceived, is however more often seen these days as an obstacle to sound forestry, because its main interest is in obtaining a financial return from the forests; it has rather less interest in ensuring that forests are thinned, or oversize trees removed, or in ensuring that its contractors keep to the rule-book. As such, it is doubtful whether the productivity from these computerised management plan operations could be sustained in the long term, as was possible under the earlier Champion's conservative Working Plan System for management (Sahajanathan, 1987; Champion, 1936). New environmental guidelines in harvesting and conversion have been introduced in the hope of rectifying the situation.

In 1994, the FMS database for forest plantation management, was transferred to the Forest Department from the FPU. There had been some managerial problems regarding the implementation of the FMS in the field, because Forest Department staff had found the FMS somewhat inaccessible for their use, not least because the manual was prepared by a non-forester and was not user-friendly. Such managerial problems are bound to arise when computerised management systems are developed and used. They inevitably raise difficult questions, for which firm decisions are required. If the management system were to break down then there is the chance that *ad hoc* cutting programmes would be resorted to and the forest plantations ruined. In the meantime a Forest Data Computer Program (FORDATA) has been developed by the University of Colombo for forest plantations. This database computer programme has been installed in three forest divisions of the Forest Department.

Conservation of natural forests

The policy to conserve forests was pursued with some vigour by the Forest Department as was recommended in the National Forest Inventory report. This ecosystem approach to forestry is today important in the management of natural forests in the country, although there is some debate as to how absolute the conservation should be. In general, it is strongly backed by the powerful environmental lobby in the country.

Forest management in the 1990s

The 1990 logging ban

In 1990, one of the most positive actions with respect to the management of the natural forests was taken: a logging ban was imposed by Government. In view of the depleted state of forest growing stock, overcutting and the resulting adverse environmental effects, the Forest Department strongly agitated for the ban and was supported by all environmental groups. The ban is still on in the natural forests, and there is a strong movement in the country to keep it so, until such time as depleted forests are replenished and forest areas increased. Meanwhile, a new inventory of the growing stock of all natural forests is required. A start was made in 1992/93 with an indicative inventory.

The ban has been popular with people living in the countryside, who are generally averse to seeing logging trucks damaging fair weather roads and culverts in or on the approaches to their villages when transporting timber from neighbouring forests. Their aversion is more so when they feel that they do not benefit by the timber extraction and that only the contractors and the State Timber Corporation benefit – although in theory every citizen should benefit from the royalties and taxes raised for government, if indeed the contractors and corporation paid them as they are supposed to.

The logging ban in natural forests prevails over most of the country except in the north where, because of the insurgency, some forests, including teak plantations along roadsides, have been cleared and timber removed for various purposes by the opposing sides. In these areas there is no forest management of any sort in either the forest plantations or natural forests. As it happens, the larger part of the natural forests of the country are located in these areas of insurgency, rather than in the eroding central tea districts where forests could be so valuable. Some increase in the natural forest cover has been noted in the North, especially in the Mullaitivu district. It is hoped that when the problems in the North are settled, the forests there will again come under management plans.

There is some concern that if renewed management operations are started involving felling of natural forest timber before the forests are adequately

restocked, then denudation will set in again. The stocking of natural forests is now considered too low and too dispersed, and the general consensus among foresters and environmentalists is that these forests have to be rested for a long time. Indeed, some may require total protection indefinitely. In the meantime, it will be important to increase the 18 Forest Divisions to 25, thereby covering all the Districts of the country, in order to intensify management and all other forestry activities. Any lifting of the logging ban has to be carefully considered as it likely to be resisted at present by rural people.

The rise of people participation

Until recently, the “top-down” approach was adopted in the management of forests, as the thinking on new participatory forestry concepts was in its infancy. However, the first steps were taken in the south when local people debarred contractors and illicit fellers, who were backed by powerful people, from entering forests. With respect to plantation establishment through agroforestry, participatory action is now well established.

On Forest Department advice, the Government decided that, in a small country like Sri Lanka, the environmental benefits of large expanses of forests would pervade the whole country and everyone should benefit equally from the goods and services forests provide. This decision was in response to the formulation of the Provincial Councils system for decentralising local government functions and development activities under the 13th amendment to the Constitution of Sri Lanka. The management of forests was always to stay at the centre as a reserved subject, but it was decided that social forestry could be practised by the new Provincial Councils concurrently with the centre. The situation may be reconsidered, and if necessary changed, to suit new Constitutional reforms being prepared by Government. If good sense prevails, natural forests, which influence the macro environment so much, will remain under central control.

Donor involvement in forestry

The British ODA is providing funds on a grant basis and technical assistance to promote scientific forest management and other activities. These bilateral

projects are the Forest Management and Planting project (FORMP) and the interconnected Forestry Land Use Mapping project (FORLUMP). Funds are also provided by the World Bank on a loan basis. These funds are from the IDA of the World Bank. ODA is working in close collaboration with the Forest Department to prepare management plans for the hill country (montane zone) in the Kandy, Matale, Kegalle, Badulla, and Nuwaraeliya Forest Divisions. The World Bank is providing loan funds to prepare plans for other locations. The forestry activities involved in these foreign-aided bilateral projects are:

- Silvicultural treatment for about 60,000 ha of established forest plantations and 40,000 ha of natural forests.
- Mapping, inventory and preparation of management plans for about 35,000 ha of forest plantations and 100,000 ha of natural forests in the dry zone.
- Mapping and an indicative inventory of about 500,000 ha of degraded forests in the dry zone.
- Management of about 40,000 ha of natural forest in the wet zone under a 30-year felling cycle as prescribed in the existing management plans. No fellings will be done as the forests now come under the logging ban.
- Some pilot social forestry activities are also included.

FORLUMP is under the Mahaweli Authority in its Kandy Branch. The project prepares maps using remote sensing techniques for the Upper Mahaweli project areas in the montane zone. The Forest Department purchases these maps to determine sites for its forest planting programme in the montane Upper Mahaweli catchment. A national forest cover map on the scale 1:250,000 was also prepared with ODA assistance in 1992, using remote sensing techniques. Most recently (1995) FORMP has prepared a 1:50,000 scale forest map of Sri Lanka with improved data, replacing the earlier 1:250,000 scale coverage. The new map provides up-to-date information for forest management planning. It provides a baseline for interpreting future changes and developments. FORMP has developed land identification techniques. Several detailed district maps have been prepared for the Kandy and Nuwaraeliya districts of the montane zone. A methodology to identify reforestation sites in the dry zone has also

been drawn up. The ODA activities are also useful in that they provide for building up an increased awareness of forestry and land use options through seminars, workshops and meetings.

This foreign bilateral assistance, although it has taken some time to get off the ground because of some linkage and staffing problems, is now on track. It is also part of a less controversial assistance package because the aid is in the form of a grant. Such foreign assistance has been found to serve as an impetus to development activities, and in this case is timely in view of the resurgence of forestry interest in the country. ODA is thus providing key support in the first step in Forest Management Planning by the preparation of maps and monitoring of forest cover.

The 1992 timber inventory

Table 2.1 gives the total timber volumes for three categories of forest in the dry zone and wet zone.

In the dry zone, volumes occurring in the larger diameter classes are of species which are of the least acceptable quality and thus not valuable. It has also been determined that the stem number of the smaller diameter classes are insufficient to ensure adequate restocking.

Table 2.1
1992 Volumes per hectare by minimum dbh limits, in m³,
for dry zone and wet zone forests.

Category	>10 cm dbh	>20 cm dbh	>30 cm dbh	>40 cm dbh	>50 cm dbh	>60 cm db	Totals
All dry monsoon forest	21		15		6	4	46
Nat. dry monsoon forest	44		33		11	8	96
Regen. <i>chena</i> in dry zone	7		4		2	0	13
All lowl. wet zone forest		168	126	86		35	415
High forest in wet zone		241	188	133		62	624
Regen. wet zone forest		170	126	24		30	350

The bulk of the trees that remain are of low value; it may not even be economic to harvest the trees, even for fuelwood. This indicates the complex nature of management prescriptions that need to be adopted to restock the forests with valuable species. Under the new system of forest management planning, a cautious approach is needed. Meanwhile, these remaining natural forests need to be zealously protected.

The situation in the lowland wet zone is far better. The forests are fairly well stocked in all diameter classes. The latest inventory results, however, show substantially lower volumes in natural forests when compared with the 1985 inventory results for the wet zone. Also, the extent of the natural forests in the wet zone is very small relative to the dry zone.

2.5 Towards a re-definition of sustained yield forestry

Sustained yield in natural forest management has been used in the past to describe the production of timber and fuelwood of the same quantity plus some increment year after year. But studies that might show whether or not the forest condition has deteriorated as a result of this management are inadequate. Sustained yield should in fact really be a sustained production of all benefits, services and products that a forest can provide, but at the moment this appears to be yet another nebulous concept, a distant dream. Sustainability in the real sense of the word, is something foresters have yet to achieve. The degraded nature of Sri Lanka's natural forests because of overcutting, both by State agencies and illegal loggers, shows how difficult it is to manage natural forests in a truly sustainable manner.

Even the very concept of sustained yield in tropical forests has been questioned – one writer referred to it as “empty words” (Pushparajah, 1986). This indicates clearly how poorly or how rarely the foresters' and forest scientists' knowledge of the dynamics of a tropical forest ecosystem (or for that matter even a man-made forest stand) has been translated into practical forest management. Sri Lanka appears to have made a start, through research workers from the universities, to find some answers to this difficult question of how tropical natural forest ecosystems can be sustainably managed. Continuing to pay lip-service to words like “sustainability” and “sustained”

without proven applications will not improve the quality of forests or benefit the people. Nevertheless, the concept of sustained yield management is always in the minds of Sri Lanka's foresters who are trying to ensure that forest production does not continue to decline. This production includes not only timber but also fuelwood, food, medicines, fauna, and other goods and services. Among the other benefits a forest should maintain are microclimate and the dryweather flow of water. However, finding the correct answers is not going to be an easy task.

To quote FAO (1993):

“the concept of sustainable forest management is now seen as the multi-purpose management of the forest so that its overall capacity to provide goods and services is not diminished.”