CHAPTER - I

Environment and Forest Management
The world population is expected to grow to 7.5 billion people in 2020. Although these latest population projections represent a slowdown from the past estimates, such a large absolute increase in population raises serious concerns about earth’s ecosystems and its peoples who are bound together in a grand and complex symbiosis. We depend on ecosystems to sustain us, but the continued health of ecosystems depends, in turn, on our use and care. Ecosystems are the productive engines of the planet, providing us with everything we need, from water we drink to the food we eat and the fibre we use for the clothing, paper or even lumber. But we are drawing on them more than ever and degrading them in some cases at an accelerating pace. However there are places where this pace has actually slowed down considerably.

Our knowledge of ecosystems has increased dramatically in recent decades. Economic development and human well-being will depend in large part on our ability to manage ecosystems more sustainably. We must know to evaluate our decisions on land and resource use in terms of how they affect the capacity of ecosystems to sustain life not only human life, but also the health and productive potentials of plants, animals and natural systems and here comes the relevance of the issues in the management of environment and more specifically temperate forests.

The specific region with world where environment has always been an important issue is the Nordic countries and will no doubt continue to be so in the future also. But here the question comes up how does one define “Scandinavia” and “Nordic countries”? This is actually a topic that every now and then causes rather heated discussion in Scandinavia. The present study will critically analyse the environmental issues in the management of temperate forests in the Nordic region. Before examining the state of environment it is appropriate to go in to the background of the region of study.
The Roman historian Pliny the Elder mentions in 67CE about an island called “Scandinavia” at the edge of the world, north of Germania. This, as it dawned much later to the civilized world, was in fact no island but the southern tip of Sweden, the Province of Scania (Skana). This term related to the word “Skade” (meaning damage in Swedish), damage that could be done to ships by the sand reefs outside southwestern Sweden. The suffix “ania” in the word “scania” on the other hand, probably comes from a word meaning “island”, of contemporary Norwegian “Oya”. Thus, the original definition of the word “Scandinavia” was purely geographical. It referred to the Scandinavian Peninsula, which is contemporary Sweden and Norway. Later, as people became more conscious of their culture, formed political unions, colonized previously uninhabited areas and conquered the land of the neighbours, the definition of the word started to stretch. “Scandinavia” became more a political and cultural concept than a geographic one. And since cultural boundaries tend to be less clearly definable than geographic ones, and political boundaries on the other hand move around quite a bit, the current use of the word is a bit of a mess. Hence the term “Nordic” is closer. The word originally comes from the Swedish term “Norden”, which was also used by French (Pays Nordiques). It was at first used for “Northern” (European) countries in general, but with the common political, economic and cultural development of Sweden, Denmark, Norway, Finland and Iceland, the term has in English widely become established as referring exclusively to these five countries.

The temperate deciduous forest has four changing seasons. These forests have hot summers and cold winters. As the seasons change, so do the

colours of the leaves of the deciduous trees. Deciduous means that these plants lose their leaves every year and grow them back.

Temperate Deciduous Forests are found in Eastern North America, Europe, and China. There is a 5-6 month growing season (150 to 200) days. About 30 to 60 inches of rain fall each year, and is fairly evenly distributed throughout the year.

The soils are fertile, due to plenty of leaf litter. There is extensive plant diversity in this biome, dominated by broadleaf deciduous hardwood trees such as oak, hickory, maple, ash, beech and more. The forests consist of 3-5 layers, which are relatively open with rich ground flora. There are usually one or two strata of trees, an under story of shrubs, and low growing shrubs. Around the world, most of the original forests have been logged, with only scattered remnants left today. One of the most interesting features of the temperate deciduous forest is its changing seasons.

Animals found here are bears, deer, bobcats, raccoons, squirrels, as well as many birds and invertebrates. The greatest concentration of animals is on and just below the forest floor.

The word “deciduous” means exactly what the leaves on these trees do, they change colour in autumn, fall off in the winter, and grow back again in the spring. This adaptation helps trees in the forest survive winter.
Next to the rainforest, the temperate deciduous gets the second-most amount of rainfall per year. In the winter, precipitation (rainfall) is in the form of sleet, snow, and hail. The average rainfall is 30 to 60 inches per year. The average temperature of the forest is about 50 degrees Fahrenheit.

Like all living things, deciduous trees and plants have special adaptations to stay alive. During the winter months, little liquid water is available to nourish the leaves of deciduous plants. This causes photosynthesis to stop, the leaves to fall off, and the plant to become dormant. Of course, the leaves grow back in the spring and photosynthesis begins again.

During the last three decades in the Developed countries public awareness towards the importance of environmental issues was increasingly growing. Popular movements generated awareness and interest in these themes among the general public. Environmental protection became a keenly debated issue in which almost all the political organisations took active interest.

Source: R. B. Bunnet, “Physical Geography in Diagrams”

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consequently a comprehensive environmental legislation and a sophisticated system of its implementation were enacted and adopted especially in the countries of Norway, Sweden and Finland.

As a result of a long history of environmental conservation, people in the Nordic countries tend not to consider these issues as anything new but rather as a part of daily life. Environmental conservation is a matter of survival in a market of increasing competition.

Forest health and vitality have been monitored in the Nordic countries for more than a decade. The main reason to monitor it was to avoid catastrophe if forests decline. There are studies on a spatial and temporal scale to show effect of pollution on the vitality of the forest health, which shows though not very clearly that current pollution load may reduce the vitality and health of the forest in future.

A new more conservation minded forestry has emerged and the goal for Scandinavian forestry is to maintain biodiversity while producing valuable wood. This also opens up new market opportunities. Last but not the least, forest is an asset for people in need for recreation in Scandinavia. Hence, it can be mentioned that Forests cover two thirds of Sweden and Finland. About 37% of Norway is under forests. Excluding these three countries, rest of Europe imports timber.³

As in most forested countries, the traditional bond between the Nordic people and their forests is still strong. Forests are an essential element of the environment in which people lead their daily lives and spend leisure time.

References are frequently found in Nordic art, folklore and language indicating that forests are an integral part of Nordic cultural heritage. For years, the Scandinavian 'Green Movement's Forest and Culture Programme' has held a regular series of 'cultural' workshops bringing together a wide range of interest from school children to women's groups. These seminars reach out to areas in society not usually involved in environment issues, thereby empowering the local population towards active involvement in societal questions, which affect their own livelihoods.

In Finland, Norway and Sweden the state owned and other Public forests are located mainly in the north and the private in the South. In Sweden the Privately owned forests are predominant in all parts of the country, but particularly in South. The state forests have the biggest share of the productive forest area in Denmark (30 percent) and the smallest in Norway (10 percent).

In the productive forest area the share of private forests ranges from 58 percent in Denmark to 84 percent in Norway. Private forests are predominant in the Nordic countries compared to other countries and continents. In Sweden about one third of the private forest area is owned by joint stock companies, whereas the corresponding share is much smaller in the other Nordic countries.

In Denmark and Norway, 90 percent of the forest properties are combined with agriculture, in Sweden 40 percent and in Finland about 40 percent of forestland area. In Finland, Norway and Sweden, the average forest area of combined farming and forest properties is considerably larger than that of plain forest properties.
With the exception of Sweden, the forest area of the Nordic countries has increased in recent years, partly because unproductive as well as farming land has been planted with trees and partly because the view on what is productive forest has changed.

All the five members of the Nordic council have already begun to ensure that all new laws and strategic plans are in line with those of the EU, including forest policy. The forest protection targets of the EU are quite higher and the governments of the countries are already looking at how to reach these stricter goals. On the other hand the economic integration will also mean an increasing presence of Scandinavian forest companies without due regards to many other countries' needs. It is therefore essential that current intensive plantation forestry model of Scandinavia not to be exported in its present form but be revised to reflect the individual countries forestry and cultural circumstances.4

Developing countries where most of the natural resources are still to be utilised or optimally utilized has to become all the more aware of the environmental degradation in case of misutilisation / over utilisation. If these trends were not altered quickly environmental destruction would reach high levels in the Developing countries in the near future and could easily result in irreparable damage to the environment on local regional and global level as well.

How forestry is affecting the employment generation in the concerned countries will be examined. Here a comparative study with India can be done

in terms of forest management. Though Scandinavian model can't be replicated in Indian context yet methods and approaches can give a clue to proper forest management in Indian society too.

The present study will not only incorporate the Scandinavian region but also the whole Nordic region. So for the research the Nordic council member countries are chosen for the present study. These countries are Iceland, Norway, Sweden, Finland and Denmark. Here it can be said that Norway and Iceland are not members of EU (European Union).

1.1 Conceptual Framework

Environmental Sustainability became a widely sought after and pursued goal in the late 1980s and early 1990s. Brundtland commission in 1987 further reinforced this goal, and the United Nations earth Summit of 1992 and further later in 2002 at WSSD (World Summit for Sustainable Development) at Johannesburg. Environmental sustainability requires balancing global life support system. While the world tries its best to achieve environmental sustainability at present, but there is simultaneous exhaustion of natural resources for further economic growth. The rapid depletion of these essential resources, coupled with the degradation of land and atmospheric quality indicate that the human interference has not only exceeded its current social carrying capacity, but also is actually reducing future potential biophysical carrying capacities by depleting and over utilisation of natural resources stocks.
There are few approaches in the study of environmental research, which can highlight on the complexity of environmental resource management. They are discussed below.  

- The Orthodox Development economists’ approach of “Trickle down theory”

The propounders of this theory base it on two premises: firstly, poverty causes environmental degradation, while wealth cures it. Secondly, development helps relieve poverty and create wealth; therefore development helps in curing environmental degradation, and alleviates poverty. In contrast to “limits to growth approach”, trickle down orthodoxy is the way to alleviate poverty is for the rich North to consume ever more products from the South, thus expanding Northern markets for Southern products, Southern exporters, who are in return become enriched and create employment for their poor compatriots leading to exporting more to the North. Northern sales receipts thus eventually “trickle down “ to the poor in the South.

- The Plutocratic Preference Approach: “The elitist Choice”

In a world full of limits, the affluence of the rich has an opportunity cost to the poor. Rich elites extract out better resources from the poor in a given politico-geographic set up. This forces landless poor onto marginal soils that are difficult or impossible to work sustainably. Elites prefer overpopulation that lowers wage rate eventually. And these elites only can induce cheap labour out migration rather than increasing wage rates in their own countries.

The rich tend to acquire more power and they benefit from power reduction of the poor. Powerlessness is a characteristic of impoverishment.

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Rich thus acquire better productive lands and poor are forced back to the marginal areas.⁶

In contrast to this view there are theorists who fear that as the more able citizens quit their respective countries in a form of brain drain, or even labour drain, there remains a lower productive capacity of the Nation. Thus the government should encourage the people to remain in their own respective countries by improving their welfare and protecting the citizens.

• The Anthropocentric View: “People Centred environmentalism”

According to this view, Man is the centre of the universe, and development planners and policy makers most popularly hold this view. This is probably closest to the World Bank's World Development Report maintaining since 1992, that it is called “people-centred environment”. This view emphasizes that humans are special on this earth. People are the centre and the rest of the nature is its derivative and periphery. It stresses that non-human species are created only for mankind. They can be used at will by human beings for their own benefit. Humans are central but their life support systems such as, environmental sustainability and biodiversity etc have just instrumental value.

• The Bio centric view: “The Deep Greens Or Deep Ecology”

Earth being the most unique planet which is probably having the uniqueness of complex web of living and non living beings. These living and non living beings, which comprises the environment, interact with each other and this interdependence is nothing but ecology. Bio centrists know that ecology means the joining together of all parts. Since human beings bear the duty of stewardship to conserve the whole interrelated living ecosystems of

the world, it is obvious that human beings are indeed unique in themselves. Here the living ecosystem is central; but humans are apart of it. Humans cannot survive without their environment and thus, they have no right to destroy the ecosystems, and making other non human resources extinct. Thus we need to conserve the environment by learning from the nature.

- The Need For Redistribution: Justice and Equity

The proponents of this view fear that neither Trickle down nor economic development can alleviate poverty. This view claims that through economic aid from the rich countries to the poor countries will at least reduce the gap between the rich and the poor.

Direct methods of poverty alleviation means improving the conditions of the poor in the form of food security, shelter, health and education. Here the rich North should alleviate the poverty of poor south.

If we see the other aspect, then, from the rich countries point of view it may seem that their tax burden would increase, but in reality unless the poor countries develop they cannot use the technology advised to them for better management of the environment effectively. And here it is important to note that “environment” is a common property and everybody is interested to save and conserve it. Thus this view of redistribution of resources is justified.

1.1.1 The Environmental Debate: Some Issues and Trends

In the second report of the club of Rome it began with “the world has a cancer and the cancer is man”. A great deal of writing is done on how badly man has misbalanced the environment. But this can be neglected by two facts; firstly man is not a discreet entity independent of the environment but is completely apart of the environment. Secondly, as the perception changes through space, “environmental change” becomes “environmental degradation.”
Environment performs three basic functions in relation to man.

- Providing amenities
- Provider of natural resources for human consumption
- Acts as a sink for assimilating waste produced by humans

And humans in turn impose four types of stresses on the environment

- Eutrophic
- Exploitative
- Disruptive
- Chemical and industrial stress

But here it should be mention that the man is not the only one causing degradation, as destruction is also caused by nature themselves such as earthquakes.

There are few more approaches towards current environmental studies

- Neoclassical
- Structuralist
- Ecological
- Club of Rome
- Faunex consensus
- International dimension
- UNEP and Eco-development

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1.1.1.1 Neo-classical Approach

This approach treats environment in two ways – firstly, it views as an externality with either positive or negative impact on the cost of operation of an individual firm. Secondly, to treat environment as a commodity for which like any other commodity, the consumer is expected to pay a price.

1.1.1.2 Structuralist Approach

The dissatisfaction with the marginal approach led to the emergence of environmentalist lobbies in the late 1960s and early seventies. Here development was not seen as an economic goal merely but as a multidimensional concept encompassing, economic, political, as well as social and cultural aspects of life. Thus, the interest shifted from “quantitative” to “qualitative” aspects of life. Here the “social environment” was emphasized more than the “physical environment”.

1.1.1.3 Ecological

Here the primary interest was not the “social environment” but the “physical environment”. They differed from Structuralist who viewed the environment as an objective of development, where as the Ecologists view the environment as a constraint of development. This group was concerned with two major types of environmental damages—firstly, pollution and secondly, exhaustion of natural resources. Here environment became an integral part of developmental thinking.

1.1.1.4 Club of Rome Approach

This approach underestimated the ability of a country with high production output and welfare with growing income, by pursuing a vigorous policy of environmental control. It also unnecessarily overstated the case of exhaustion of resources. It also looked at the environment from the rich country perspectives.
1.1.1.5 Faunex Consensus

The report from Faunex in Geneva under United Nations Conference on Human Environment showed that, while roots of most current environmental problems could be found in the activities of the industrialized countries, for many reasons environment is of equally important concern to the countries of the Third World. This report made a distinction between the environmental problems faced by the Developed countries such as industrial pollution, depletion of scarce resources etc and, also those faced by the poor countries such as clean water, food, shelter, sanitation etc. Thus it highlighted the importance of social and economic factors in the discussion on environment such as poverty, inequality and social participation.

1.1.1.6 International Dimension

This approach gained popularity after 1973 oil crisis. It raised two kinds of issues. Firstly, how rich countries have consumed the larger portions of available natural resources and secondly, the Developed countries have a control over the world trade and thus the prices from the Third World export goods are deliberately reduced.

The major theme introduced here was to establish a new international economic order (NIEO), which will greatly reduce the inequitable trade by reducing the disparities between the Developed countries and the Underdeveloped countries through regulations.

1.1.1.7 UNEP and Eco-development

UNEP was formed after the 1972 Stockholm conference with its headquarters at Kenya, which is a Third World country with rich wildlife heritage. Its activities covered four main areas -

- Evaluation and review of resource management
- Monitoring through Global Environmental Monitoring System
• Information exchange through the machinery of International Referral System
• Research on ecosystems, human settlement etc for developing environment-development interaction.

Lastly, it can be said that the "environment" is not indivisible as there can be diverse environmental objectives, and with the given finite resources available for environment protection, no single environmental policy and programme can obtain a simultaneous fulfilment of them all.

To sum up it can be said after seeing almost all the important views, that the attitude and mind set of people have to undergo a change for better. Awareness about sustainable development and effective environmental management has to be created. And at this juncture the role of people and non-governmental organisations become important.

Problems and issues are of varying nature; therefore, comprehensive views and concerted efforts of all participants can only bring desired outcomes in the field of effective environmental management and sustainable development.

1.2 Conservation Focus on Biodiversity

Due to intensive economic growth, Scandinavia has very little old growth forests; however, semi-natural forests including forest communities of high biodiversity cover a large area. Apart from the conservation of old forests, the main challenge for nature conservation is the practice of biodiversity in all forests, including commercial forests which form the greatest part of the forest estate.
1.2.1 Conservation Issues

Forests are being cleared for agriculture and wood products in most parts of the world, but in the Nordic region the trend is reversing and the areas of affected lands have begun to shrink. The reversal is due in part to increased productivity of agriculture and at the same time better and more efficient end use and improved technology for maintaining the forests. Similar improvements are evident in the forest products industry. Much potential exists for meeting the industrial forest product needs of double of today's population from a smaller area of forests than is being harvested today.

If forests production were to follow an "extensive" mode of production -- expanding the area of forests affected while not doing much to improve yields - in the year 2050 nearly fifty percent of the world's forests are likely to be under logging. By contrast, an intensive management system as in Scandinavia based on improved yields and increased efficiency of end use - would require only one - quarter of the world's forests. Combined with continued intensification of agriculture - which could halt and reverse the conversion of forests to agriculture worldwide the implications are that as such as three quarters of the current forest area of the world could be protected for environmental and local community benefits.

The possibilities for more than 10 fold increases in forest productivity and for providing an alternative source of wood supply to extensive harvesting of natural forests have already been demonstrated in the temperate forests of the Scandinavian region.

Given the potential for such improvements, what broad World targets should be set for forest protection? What methodology should be employed to analyse the potential? What are the social, economic and environmental
implications of extensive versus intensive patterns of forest use? These are the questions that the present study will attempt to examine.

One suggested approach to answer the above questions would be to set desirable forest conservation targets, based on analysis of the potential for reducing threats to forests. The setting of these targets could use as point of departure -- a scenario of the likely consequences of failure to take action (continued loss of forests, extinction of species, social hardship, etc.). Here the Indian scenario can be seen compared to the Scandinavian region.

1.2.2 Threats to Forests: Agricultural Encroachment

Forests today face many threats such as population pressure, badly planned roads, mining, oil exploration and many other factors. Of these various factors encroachment pressures for conservation of forestland to agriculture are an especially difficult problem - and one, which the present study will examine especially of the Indian context. While the answer is likely to vary by region like forests in the tropical regions are generally shrinking while forests in the temperate climates are increasing, it is suggested that per capita incomes, and rural to urban population migration could reduce agriculture encroachment pressure on forests.

It was suggested in the conference on “potential for forests production through 2050: Development of a Research Project and a Global vision for Forests” held on June 17, 1999 in Washington D.C. undertaken jointly by the council on Foreign Relations, Rockfellen University and the World Bank/WWF Alliance, that in the longer term, as these and other threats to forests are brought under control it was conceivable that there would be an increase in the global forest area from 3.2 billion hectares to perhaps 3.5 billion hectares by the year 2050. Studies carried out by IIASA and by FAO
would be helpful in clarifying how much forest and are likely to be lost to agriculture between now and 2050. Non-forest, non-agricultural crosscutting issues particularly urban sprawl, and infrastructure expansions were noted to be strong forces that must also be considered.

1.3 Equity And Social Issues

Just as it is difficult to determine the impact of unknown technologies on forest protection on known societal values for the next fifty years, make it equally difficult to understand the equity issues behind forest management and the impact of potentially protecting 75% of the world's forestland. A key issue is the likely impact of ongoing trends towards intensification of forest management in indigenous forest dwelling populations and local communities. Many studies by conservation agencies and environmentally concerned groups such as IUCN, the Forest People Progress and also by FAO have made a strong case for more people oriented forest policies.8

Equity must also be viewed at the global level. Current high levels of consumption in the developed world are creating pressure for expansion of non-sustainable and ecologically destructive forest harvesting in the South.

The trends in recent years have been towards increased involvement of local communities in control and management of forest resources and insistence of ordinary citizens in being consulted about how forests should be managed and for whose benefit. Any analysis of global forest trends will need to consider the implications for the poor and weaker segments of society.

As the forests are owned by Govt., cooperatives and the private owners there arises conflicting needs and hence objections arise, like for an example land owners in Finland objected to Nature 2000 and thus they will get compensation when restriction on usage was introduced.

Many other issues peculiar to this region are raised like the study conducted by Kerstin Sundberg has talked about how common rights versus property rights, socio-economic structure, ecological situations and control for the forest as a resource change in forest resources are basically seen as a cultural process. Ingar Kaldal has examined how forests have generated Gender issues.

1.3.1 Forest Management Problems

Forest management and forest protection have a long tradition in Nordic region and can be traced back to more than 70 years, when scarcity of wood for ship construction forced early conservation measures. Today forest management problems are mostly related to privatisation of forestlands, strict policy regulations and reduction of biodiversity. Forest management in these privatised lands is expected to be intensive. Moreover, the market economy has induced more intensive usage of the remaining State forests.

The consumption of wood has increased from 3-4 million cubic metres per year in 1980s to more than 5 million cubic metres in 1997 and continues to grow. Uncontrolled growth in forest consumption may endanger the biodiversity and health of the forests, especially as threatened species are poorly studied and the network of protected areas have been developed but without overall planning.
The rapidly growing number of modern sawmills has resulted in growing volume of production. In many areas local companies and private operators who sometimes do not take adequate measures for conservation carry out logging. A section of the timber business is illegal and may involve uncontrolled logging and trade.⁹

1.4 Forestry Research And Policy

A series of research and development programmes has been launched to improve the planning, development and protection of forests. The all the five countries have worked out a state forest policy individually and strategic plan has been carried out for the new forestry law due to be approved by the Nordic council. The issue of biodiversity and sustainable forestry are being thoroughly studied. A key problem of forestry is the conflict between dominating business interests and aspects of forest protection. For instance the research into recognising key biotypes is in an embryonic stage and requires extensive study and the network of protected areas in insufficient.

The certification of forests has been initiated in spring 1996 by the Ministry of Agriculture and Forestry of the Nordic Council by setting up a committee on “Forest Certification” which is compatible with AEU, ISO and FSC requirement and suitable for farm forestry.

Some of the NGOs involved in forestry problems include Finish Green Movement, Union of Protected Areas, and Union of Foresters.

All the scientific investigations in the Nordic region would be assessed in terms of potential human impact and interest. Social science research, particularly studies of human subjects, requires special considerations, as do studies of resources of economic, cultural and social value to native people.

Lot of research conducted by the Nordic Council in Norway, Sweden and Finland especially directed towards improving the understanding, use and management of Nordic region's natural resources, especially the temperate and northern boreal forests. Research centres on the dynamics of mixed stands and the cumulative effects of management activities on hydrology, soils, vegetation, wildlife, carbon reserves, insects and fire in temperate and boreal ecosystems are conducted by Department of Agriculture under the classification of "Forest Service" and at the same time cooperative "State Research, Education and Extension Service" conducts research in natural resources and forestry addressing forest floor organic matter reserves, ecosystem sustainability, soil classification, wild life habitat, quantification of productivity and distribution of vegetation. "Natural Resources conservation science" conducts research on vegetation, landform and carbon confiscation relationships in support of the Global change research programme. "Agricultural Research Service" conducts research on plant science emphasizing germ plasma preservation to protect native plant species with emphasis on commercial value and utility for erosion control. These are few amongst the many to name. At the same time the Department of State conducts research on "Man and the Biosphere Programme" where working with indigenous communities, the programme seeks to ensure sound management of key renewable resources.

In the present study the efforts will be to draw attention to the most important aspects and differences in hazards of environmental destruction in
these countries. At the same time an effort will be made to show the applicability and the possibilities of universal application of environmental legislation taken in the member countries for environmental protection.

The study may contribute to generate more consciousness and develop responsible awareness towards environmental issues by calling attention to the urgency of the work to be done in this field. The lessons learnt from this research work of the region taken can become an eye opener for the ever degrading environmental condition especially where deforestation is concerned at the global level.

Here can be a discussion on Asian-Forestry specially the Indian Scenario, which needs to be reinvented. Foresters must shift away from merely applying Silvi cultural treatments to existing stands and plantations. For forestry projects and programmes to succeed, the participation of forest dwellers and of the larger national community is essential. They must have a sense of ownership in these projects. Forestry is no longer a concern of only technical forestry specialists. Expertise is needed from other disciplines like ecology, economics, law and community organisation to meet the new demands on forestry to protect the environment and the forest dwellers.

Forests have to be seen in a new light as a valuable economic resource having multiple use and multiple users. Consequently the practice of forest management has to change from tree management to ecosystem management, in which people play a significant role. Unless forests are seen as having an economic value to individuals, local communities and national governments and can be used to fuel economic development and alleviate poverty as has happened in Scandinavian region - the Asian forests will remain in crisis.
Issues in Asia and especially the Indian scenario in management of forests will be discussed in detail. The debates regarding forest products use by the local communities and governments' restrictions over forest management in India will be discussed.

The social environment in management of forests in Nordic region in comparison to Indian forest management will be discussed where collaborative work of government, NGOs and local communities will be seen.

The study will cover the issues of environmental protection broadly in the region taken; then individually the deforestation rates, forest cover over a period of time will be shown; governmental steps and measures regarding forest management taken will be discussed; working of NGOs and public participation in forest management will be discussed; importance of forest in economic and socio-cultural life of the people concerned will be discussed.

Thus covering these broad aspects the study will try to emphasize the need to become Green and increasing the Green cover in the region concerned by adopting appropriate technology.

1.5 The Environment

The environment has always been an important issue in the Nordic countries and will no doubt continue to be so in the future. The greenhouse effect is giving an increased cause for concern and is a subject of constant research.

One of the main problems currently facing Scandinavia comes from the east. The northern territories of Russia's Kola Peninsula, which neighbour
the northern territories of Norway, Sweden and Finland, are a nickel-producing region. These mines and processing plants are the sole source of livelihood for a large part of the population.\textsuperscript{10}

The Russian waste, carried by the wind, is a serious threat to these areas. Russia produces an estimated 280,000-ton of sulphur every year, which is five times more than the annual quantity of sulphur waste in Norwegian industry. Damage is already visible in Norway. The dumping of nuclear waste, solid waste, radioactive waste and reactor parts in the Barents Sea is common practice on the Russian side. Both parties acknowledge the seriousness of this situation; however, while no restrictions are observed in Russia, the Nordic regions are unable to take measures to save their environment. Co-operation is currently under way between the authorities involved, aimed at introducing purification methods and at the same time modernizing plants. This work has already started, but the magnitude of the problem involves a lot of time and huge sums of money.

Greenland, Iceland and the Faroe Islands all depend on the North Atlantic for their livelihood. Its waters have a reputation for freshness and purity. Environmental, restrictions are thus not merely important for these three countries, but a matter of life and death. There are strict regulations on the dumping of waste, whether sewage or industrial. The Nordic countries are proud to have earned a reputation as a clean region; nevertheless problems do arise in this part of the world as everywhere else.

The Baltic Sea, which once was clean and fertile, is also considerably polluted. Stocks of fish are extinct and bathing in some areas is dangerous.

This time the Russians are not the only party to blame. All the countries with coastlines on the Baltic have accepted their share of the blame. Tight control during the last few years has produced some improvement, but a clean Baltic Sea is still a long way off. Despite these problems, the Nordic countries have managed to keep their territory remarkably clean, by maintaining very strict regulations.

As a result of a long history of environmental conservation, people in the Nordic countries tend not to consider these issues as anything new but rather as a part of daily life. Especially in the more remote parts where fishing and tourism are important, environmental conservation is a matter of survival in a market of increasing competition.

1.6 Cultural Background

“Nordic-ness” is a term which raises debates every now and then within the Nordic countries. Whether Nordic art exists as a separate entity is questioned by art historians, critics and the artists themselves.

Although the countries are cultural and geographical neighbours, they each have a different cultural heritage. Denmark is on the border of Scandinavia and the rest of Europe, a trading and seafaring nation, which has come under influences from the south and west, from countries like France and England. Denmark has been a member of the European Union since 1972 and even prior to that time, considered itself more European than Scandinavian.

Norway's vast coastline opens the country to the world. The isolation of the high mountains and deep fjords in the past resulted in a rich local folk
culture, which still leaves its mark on the nation. Sweden, which is closed in at the centre of Scandinavia, cultivated its cultural contacts with Germany and countries in the east across the Baltic Sea. Finland's situation between east and west resulted in a fruitful mix of the two, with strong tendencies towards the east.  

Iceland has always identified with the Scandinavians culturally, although its geographical position allows equally for links in other directions. During past centuries, Icelanders were educated mainly in Denmark, but this century, and especially after the Second World War, cultural relations with the rest of Europe and the United States have become closer. Greenland has quite a different cultural background from the rest of the Nordic countries. Eighty per cent of the population is Inuit and the rest is primarily Danish. Greenland has always represented the outer frontier of human settlement due to conditions caused by its geographical position.

Culture in Greenland has been influenced by its harsh geographical conditions. Traditional hunting for fish, seals and whales was by far the greatest source of livelihood for centuries. Fishing has become the most important part of the modem industry, though some regions like the east and north still depend on hunting as their chief occupation.

Culturally, Scandinavia at that time consisted of the three present-day kingdoms; Denmark, Sweden and Norway and a part of present-day Finland. The area was huge, extending from north of the Arctic Circle in the North to areas, which now belong to Germany. The territory in Scandinavia ranged

from flat, agriculturally rich lowlands, with rivers as a means of transportation, to deep fjords and isolated mountainous regions.

The majority of the population were farmers, hunters and fishermen. Landowners who had many sons and thus were able to extend their wealth by dowries brought into the families by marriage controlled the wealth. Established places of trade and commerce were founded during the Viking Age at suitable geographical sites, and silver was the most frequently used currency for commercial transactions.

The Socio-economic transformation has accompanied with keen concern on the environmental conservation, which not only look after the local and national issues but regional ones too.

Long after the Nordic convention in 1974 was signed by the Scandinavian countries to protect the environment in 1988 an important landmark was achieved in terms of protection of environment as just after the murder of Olof Palme in February 1986, the Miljopartiet de Grona (MPG), the Swedish Green Party recorded a massive victory in Parliamentary election in 1988\(^{12}\) and there after several legislation was passed for environmental protection.

1.7 Nordic Council

The Nordic Council was founded in 1952 for co-operation between the Nordic parliaments and governments. The members are Denmark,

\(^{12}\) Ministry of Environment Sweden, Swedish Environmental Legislation, Booklets 1,2,3,4, (Stockholm, 1996).
Iceland, Norway, Sweden and Finland. A brief description of the five countries is given below.

1.7.1 Norway

Despite its neutrality, Norway was not able to avoid occupation by Germany in World War II. In 1949, neutrality was abandoned and Norway became a member of NATO. Discovery of oil and gas in adjacent waters in the late 1960s boosted Norway's economic fortunes. The current focus is on containing spending on the extensive welfare system and planning for the time when petroleum reserves are depleted. In referenda held in 1972 and 1994, Norway rejected joining the EU.\(^\text{13}\)

Norway is located in Northern Europe to the west of Sweden bordering the North Sea and the North Atlantic Ocean. Its geographical coordinates are 62°00' N, 10°00' E. If compared area is slightly larger than New Mexico. Its total area is 324,220 sq km in which land is 307,860 sq km and water is 16,360 sq km

Land boundaries are totally 2,515 km bordering countries, Finland with 729 km, Sweden of 1,619 km, and with Russia it is 167 km. Coastline is of 21,925 km (includes mainland 3,419 km, large islands 2,413 km, long fjords, numerous small islands, and minor indentations 16,093 km). Its Maritime claims includes contiguous zone of 10 nm, continental shelf of 200 nm, exclusive economic zone of 200 nm, and territorial sea: of 4 nm.

Climate in Norway is temperate along coast, which is modified by North Atlantic Current. It has colder interior with rainy round the year on the

Figure 1.2
west coast. Terrain is glaciated; mostly high plateaus and rugged mountains broken by fertile valleys; small, scattered plains. Its coastline is deeply indented by fjords. Arctic tundra is in the north. If we see the Elevation extremes the lowest point is Norwegian Sea 0 m and highest point is Galdhopiggeh 2,469 m.

Natural resources found here are petroleum, copper, natural gas, pyrites, nickel, iron ore, zinc, lead, fish, timber, and hydropower. Land use pattern shows that arable land is 3% permanent crops is 0%, permanent pastures is 0%, forests and woodland is 27%, others are 70%. Irrigated land is of 970 sq km (1993 est.)

Broadly environmental issues are water pollution; acid rain damaging forests and adversely affecting lakes, threatening fish stocks; air pollution from vehicle emissions. Amongst which the influence on the forest is the main concern of the study.

Norway is party to many environment related international agreements few amongst them are the following- Air Pollution, Air Pollution-Nitrogen Oxides, Air Pollution-Persistent Organic Pollutants, Air Pollution-Sulphur 85, Air Pollution-Sulphur 94, Air Pollution-Volatile Organic Compounds, Antarctic-Environmental Protocol, Antarctic Treaty, Biodiversity, Climate Change, Desertification, Endangered Species, Environmental Modification, Hazardous Wastes, Law of the Sea, Marine Dumping, Nuclear Test Ban, Ozone Layer Protection, Ship Pollution, Tropical Timber 83, Tropical Timber 94, Wetlands, Whaling signed, but not ratified is Climate Change-Kyoto Protocol
Norway is about two-thirds mountains; some 50,000 islands off its much indented coastline; strategic location are adjacent to sea-lanes and air routes in North Atlantic. One of most rugged and longest coastlines in world, Norway is the only NATO member having a land boundary with Russia.

Population is about if we take 2000 yr estimation is 4,481,162 (July 2000 est.) If we see the age structure enumerated below 0-14 years 20% (male 459,608; female 434,809) 15-64 years 65% (male 1,472,974; female 1,430,526) 65 years and over 15% (male 283,741; female 399,504) (2000 est.) , We find that the working age group is got quite high percentage, which is a very positive sign for economic development. Population growth rate is only 0.5% (2000 est.) Birth rate is 12.79-births/1,000 population (2000 est.) whereas death rate is 9.89-deaths/1,000 population (2000 est.).

Ethnic groups found here are Norwegian (Nordic, Alpine, Baltic), Lapps (Sami) 20,000 in number. Religions followed here are Evangelical Lutheran 86% (state church), other Protestant and Roman Catholic 3%, other 1%, unknown 10% (1997). The official language is Norwegian but small Lapp and Finnish speaking minorities are also present.

1.7.2 Sweden

A military power during the 17th century, Sweden has not participated in any war in almost two centuries. An armed neutrality was preserved in both World Wars. Sweden's long-successful economic formula of a capitalist system interlarded with substantial welfare elements has recently been undermined by high unemployment, rising maintenance costs, and a declining position in world markets. Indecision over the country's role in the political and economic
Figure 1.3
integration of Europe caused Sweden not to join the EU until 1995, and to forgo the introduction of the euro in 1999.\textsuperscript{14}

Sweden is located in Northern Europe, bordering the Baltic Sea, Gulf of Bothnia, Kattegat, and Skagerrak, between Finland and Norway. Geographic coordinates of Sweden are 62°00' N, 15°00' E. Total area is of 449,964 sq km in which land is of 410,934 sq km and water is of 39,030 sq km. If area is compared then it is slightly larger than California. Land boundaries are of total 2,205 km in which border countries are Finland 586 km, Norway 1,619 km Coastline is of 3,218 km. Maritime claims of Sweden are continental shelf is of 200-m depth or to the depth of exploitation, exclusive economic zone is agreed boundaries or midlines and territorial sea is 12 nm (adjustments made to return a portion of straits to high seas).

Climate here is temperate in south with cold, cloudy winters and cool, partly cloudy summers; but sub arctic in north. Terrain is mostly flat or gently rolling lowlands; mountains in west. If we note the Elevation extremes then lowest point is Baltic Sea 0 m and highest point is Kebnekaise 2,111 m.

Natural resources found here are zinc, iron ore, lead, copper, silver, timber, uranium, and hydropower. Land use pattern is arable land 7%, permanent crops 0%, permanent pastures 1%, forests and woodland 68% and others 24% (1993 est.) 68% of forests and woodland is quite high from the world's standard point. Irrigated land is1,150 sq km (1993 est.). Current environment issues are acid rain damaging soils and lakes; pollution of the North Sea and the Baltic Sea.


Population is 8,873,052 (July 2000 est.) Age structure is 0-14 years: 18% (male 837,358; female 794,774) 15-64 years: 64% (male 2,901,809; female 2,805,138) 65 years and over: 18% (male 648,865; female 885,108) (2000 est.) Again quite high working group shows the sign of development. Population growth rate is 0.02% (2000 est.) Birth rate is 10.01-births/1,000 population (2000 est.) Death rate is 10.62-deaths/1,000 population (2000 est.).

Ethnic groups found here are indigenous populations in which Swedes and Finnish and Lapp (Sami) are minorities. Foreign-born or first-generation immigrants are Finns, Yugoslavs, Danes, Norwegians, Greeks, and Turks. Religions followed here are Lutheran 87%, Roman Catholic, Orthodox, Baptist, and Muslim, Jewish, Buddhist. The official language here is Swedish but small Lapp and Finnish speaking minorities are also present.

1.7.3 Finland

Ruled by Sweden from the 12th to the 19th centuries and by Russia from 1809, Finland finally won its independence in 1917. During World War II, it was able to successfully defend its freedom and fend off invasions by the
Figure 1.3
Soviet Union and Germany. In the subsequent half century, the Finns have made a remarkable transformation from a farm/forest economy to a diversified modern industrial economy; per capita income is now on par with Western Europe. As a member of the European Union, Finland was the only Nordic state to join the euro system at its initiation in January 1999.15

Finland is located in Northern Europe, bordering the Baltic Sea, Gulf of Bothnia, and Gulf of Finland, between Sweden and Russia. Its Geographic coordinates are 64°00' N, 26°00' E. Its total area is 337,030 sq km in which land is 305,470 sq km and water 31,560 sq km. If compared, it is slightly smaller than Montana. Land boundaries are in total 2,628 km amongst which border countries are Norway 729 km, Sweden 586 km, and Russia 1,313 km and its coastline is 1,126 km (excludes islands and coastal indentations).

Maritime claims of Finland are contiguous zone 6 nm, continental shelf 200-m depth or to the depth of exploitation, exclusive fishing zone 12 nm, territorial sea 12 nm (in the Gulf of Finland - 3 nm). Climate here is cold temperate; potentially sub arctic, but comparatively mild because of moderating influence of the North Atlantic Current, Baltic Sea, and more than 60,000 lakes. Finland is also known as 'land of thousand lakes.'

Terrain is mostly low, flat to rolling plains interspersed with lakes and low hills. If we see the Elevation extremes, the lowest point is Baltic Sea 0 m and the highest point is Haltiatunturi 1,328 m. Natural resources found here are timber, copper, zinc, and iron ore, silver. Land use pattern is arable land.

15 Finnish Statistical Year Book of Forestry 2000, pp330-366
8%, permanent crops 0%, permanent pastures 0%, forests and woodland 76% and others 16%. Irrigated lands are 640 sq km (1993 est.).

Current environment issues are air pollution from manufacturing and power plants contributing to acid rain; water pollution from industrial wastes, agricultural chemicals; habitat loss threatens wildlife populations.


Interestingly Finland has a long boundary with Russia. Helsinki is northernmost national capital on European continent. Population is concentrated on small southwestern coastal plain. Finland has a population of 5,167,486. Age structure is 0-14 years 18% (male 478,497; female 459,646), 15-64 years 67% (male 1,747,738; female 1,712,058), 65 years and over 15% (male 295,177; female 474,370) (2000 est.). Like the other two countries the age structure shows a positive sign of development. Population growth rate is 0.17% (2000 est.) Birth rate 10.8 births/1,000 population (2000 est.) whereas death rate is 9.73-deaths/1,000 population (2000 est.).
Ethnic groups found here are Finn 93%, Swede 6%, Lapp 0.11%, Roma 0.12%, and Tatar 0.02%. Religions followed here are Evangelical Lutheran 89%, Greek Orthodox 1%, none 9%, and other 1%. Languages spoken here are Finnish 93.4% (official), Swedish 5.9% (official), small Lapp- and Russian-speaking minorities are also present here.

1.7.4 Denmark

Once the seat of Viking raiders and later a major north European power, Denmark has evolved into a modern, prosperous nation that is participating in the political and economic integration of Europe. So far, however, the country has opted out of some aspects of the European Union's Maastricht Treaty, including the new joint monetary system.16

Denmark is located in Northern Europe, bordering the Baltic Sea and the North Sea, on a peninsula north of Germany. Its Geographic coordinates are 56 00 N, 10 00 E. Its total area is 43,094 sq km in which land is 42,394 sq km and water is 700 sq km. It includes the island of Bornholm in the Baltic Sea and the rest of metropolitan Denmark, but excludes the Faroe Islands and Greenland. If compared it is slightly less than twice the size of Massachusetts. Land boundaries in total are 68 km and border countries Germany 68 km. Coastline is of 7,314 km.

Maritime claims of Denmark are contiguous zone 24 nm, continental shelf 200-m depth or to the depth of exploitation, exclusive economic zone 200 nm, territorial sea 12 nm. Climate here is temperate; humid and overcast; mild, windy winters and cool summers.

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16 Europa Year Book 2002, pp320 -351
Terrain is low and flat to gently rolling plains. If elevation extremes are seen then lowest point is Lammevfjord -7 m and highest point is Ejer Bavnehoj 173 m. Natural resources here found are petroleum, natural gas, fish, salt, limestone, stone, gravel and sand. Land use pattern are arable land 60%, permanent crops 0%, permanent pastures 5% forests and woodland 10% and others 25%. Irrigated land is 4,350 sq km (1993 est.). Current environment issues are air pollution, principally from vehicle and power plant emissions; nitrogen and phosphorus pollution of the North Sea; drinking and surface water becoming polluted from animal wastes and pesticides.


It is interesting to note that Denmark controls Danish Straits (Skagerrak and Kattegat) linking Baltic and North Seas and about one-quarter of the population lives in Copenhagen. Population is of 5,336,394 Age structure is 0-14 years 18% (male 505,820; female 479,815), 15-64 years 67% (male 1,802,665; female 1,755,633), 65 years and over 15% (male 330,055; female 462,406) (2000 est.)
Ethnic groups found here are Scandinavian, Inuit, Faroese, and German. Religions followed here are Evangelical Lutheran 97%, other Protestant and Roman Catholic and other. Languages spoken here are Danish, Faroese, Greenlandic (an Inuit dialect), German (small minority). But here English is the predominant second language.

1.7.5 Iceland

Settled by Norwegians and Celtic (Scottish and Irish) immigrants during the late 9th and 10th centuries, Iceland boasts the world’s oldest parliament, the Althing, established in 930. Independent for over 300 years, Iceland was subsequently ruled by Norway and Denmark. Limited home rule was granted in 1874 and complete independence attained in 1944. Literacy, longevity, income, and social cohesion are first-rate by world standards.\(^{17}\)

Iceland is located in Northern Europe, island between the Greenland Sea and the North Atlantic Ocean, northwest of the UK. Its Geographic coordinates are 65°00’N, 18°00’W. Its total area is 103,000 sq km out of which land is 100,250 sq km and water is 2,750 sq km. If area is compared then it is slightly smaller than Kentucky. Coastline is of 4,988 km. Maritime claims of Denmark are continental shelf 200 nm or to the edge of the continental margin, exclusive economic zone 200 nm and territorial sea 12 nm.

Climate here is temperate; moderated by North Atlantic Current; mild, windy winters; damp, cool summers. Terrain is mostly plateau interspersed with mountain peaks, ice fields; coast deeply indented by bays and fiords. Elevation extremes if seen are lowest point Atlantic Ocean 0 m and highest

\(^{17}\) ibid, pp380-382
ICELAND

Figure 1.6
point Hvannadalshnukur 2,119 m. Natural resources found here are fish, hydropower, geothermal power, and diatomite.


It is strategically located between Greenland and Europe. It is the westernmost European country; it has more land covered by glaciers than in all of continental Europe. Population is of 276,365. Age structure is 0-14 years 23% (male 33,119; female 31,222), 15-64 years: 65% (male 90,599; female 88,982), 65 years and over 12% (male 14,555; female 17,888) (2000 est.). Ethnic groups found here are homogeneous mixture of descendants of Norwegians and Celts. Religions followed here are Evangelical Lutheran 91%, other Protestant and Roman Catholic, none (1997). Icelandic is the National language.

The issue of criteria and indicators for sustainable forest management was brought into the political debate during preparations for the United Nations Conference on Environment and Development in 1992, when the Canadian delegation presented a proposal for guidelines on international cooperation and negotiations for development projects. The only trace left of this proposal in the Declaration of Forest Principles was a reference to "governing principles taking account of the relevant methodologies and
criteria that have been internationally agreed, when they are judicious and applicable”. This minimal agreement did, however, pave the way for some major achievements: the Helsinki, Montreal and Tarapoto Processes and the mandate of the Intergovernmental Panel on Forests, not to mention the pioneering work of the International Tropical Timber Organization and the World Wide Fund for Nature.

1.8 Indicators for Sustainable Management

The concept of criteria and indicators for sustainable management has various aspects - with consequent ambiguities and this in part explains the amount of attention it receives. Four major issues are involved and they can be analysed separately.18 Here it can be said that the spatio-political aspects for sustainable forest management will be analysed.

1) At the national or provincial level where forestry policy is developed and actually implemented, criteria and indicators are tools for assessing the relevance and consistency of any action undertaken. No matter how sophisticated the instruments used in developing and implementing forestry projects, the contradictory results of public assessments in different countries over the past ten years have shown that an unquestioned reliance on technical expertise and a systematic chain of implementation are no guarantee against what turn out to be serious errors and glaring negative examples, nor against the unforeseen ill-effects that are part and parcel of any complex process. Most administrations now recognize that no forestry policy will automatically bear good results simply by following the procedures approved, but that

constant reassessment (national, provincial or international) is needed on the basis of indicators covering a wide range of concerns.

2) Public opinion is increasingly concerned about forests, as they are seen as archetypal images of nature. Moreover, traditional approaches to policy-making and information on forests are no longer being accepted in democratic societies where participation and transparency in decision-making are considered a right as well as a guarantee that opposing views will be heard. Forests are not protected islands totally cut off from the workings of the rest of society, and foresters on their own cannot hope to grasp and control all the factors affecting their choices and goals. Criteria and indicators are first and foremost useful tools in setting up dialogue with all those who claim a voice in forestry policies and how they are implemented.

3) In countries where the state does not have direct overall charge of forests, forest owners or concession holders are subject to certain constraints, adapting the broad outlines of national forestry policy to local economic, environmental, legal and social contexts. There are two major approaches here: that of imposing the use of certain methods, instruments or procedures and that of specifying the objectives or obligations to be met. The former has traditionally been preferred, but there is growing support for the latter, based on the assumption that local managers are in the best position to choose the most effective and cheapest methods, instruments or procedures once the public authorities have clearly defined the objectives. This use of decision-making criteria and indicators of results thus requires that norms be fixed for management units - a procedure not necessarily required for the two previous approaches.
4) To sway forest management according to their own analyses and priorities, some large environmental and consumer protection associations try to exert pressure on policy-makers or local managers by encouraging buyers to prefer products that are eco-certified over those that are merely tolerated or boycotted. An eco-certification procedure focuses on the quality of forest management and thus requires a prior definition of the criteria and indicators to be used as a basis for the guarantees that buyers are expected to demand. As with the previous point, this is basically a normative approach but it also raises the question of the choice and legitimacy of the structure that dictates these norms and gives credibility to eco-certification in the eyes of buyers. Theoretically, this normative approach can be applied equally well at the national or provincial levels where forestry policy is developed as at the management unit level. It can also be developed just as well in terms of methods, instruments and procedures as in terms of results.

In the context of issues 1 and 2, attention must be paid both to the absolute values of indicators and to the changes observed between two evaluations. Although absolute values are clearly important, the biogeographical context and the historical background to forestry policy largely dictate them; they flow from an observed situation in which the possibility of short-term (and often medium-term) action is bound to be limited, given the length of forest cycles and social resistance to any change. By contrast, changes are extremely important since they show the actual consequences of official goals, thus allowing a check on possible discrepancies between official pronouncements on forestry policy and its concrete outcome.

Even when evaluation of a forestry policy or one of its aspects involves the examination of absolute values, this has to be done by referring to the objectives that the relevant government has freely set itself or that follow from
negotiated and freely ratified international agreements. Although the importance of measuring changes is not forgotten in the framework of issues 3 and 4, the emphasis here is on absolute values, which are specified case by case and allow an evaluation of how closely a given instance of management is in line with a reference model, whether explicit or implicit.

The Helsinki and Tarapoto Processes, and to a large degree the Montreal Process, have very clearly chosen to emphasize issues 1 and 2, while the large international non-governmental organizations (NGOs) have devoted their energy to issues 3 and 4. This does not mean that various governments involved in these processes are not also very sensitive to issues 3 and 4 (even if it is only the major northern wood-exporting countries and countries where NGOs have a powerful influence), but at present there is no intergovernmental consensus to move in this direction, despite consultations and work within individual countries and the growing number of international and European Union work groups on eco-certification. Similarly, the large NGOs cannot ignore issues 1 and 2, although their strategic concerns and analyses mean that they will attack - and often very forcefully - the priority given them by various countries. Moreover, the lists of criteria and indicators developed in response to issues 1 and 2 on the national or provincial level are not necessarily relevant to issues 3 and 4.

1.9 The Constraints and Opportunities

The identification of criteria and indicators is also a practical attempt to avoid the pitfalls of an overly theoretical approach that seeks to specify all the conditions for sustainable management in the abstract and to confine the provisional state of a technical-scientific and political-cultural consensus within a necessarily complex definition. The list of criteria and indicators adopted by the Helsinki and Montreal Processes reflects a compromise
supported by both forest professionals and scientists. It encompasses indicators of both methods and results, since the very partial state of scientific knowledge means that we cannot yet do without the past centuries' experience with different methods. The main aim of the selection process has been to adopt scientifically relevant indicators whose measurement is technically feasible and whose cost is not prohibitive. While results are admittedly imperfect, progress in scientific knowledge and instruments and the questions raised by public opinion should allow the present list, which is already long, to be further expanded and systematized.

Although the lists adopted by the Helsinki and Montreal Processes are rooted in very different contexts (the level of human intervention in forests, the structure of landholdings, the antiquity of forest laws and regulations, etc.), they are in fact fairly similar. They take account of: traditional biological parameters (area, volume, biological growth, forest type, etc.) as well as those raised by the 1980s debate on acid rain (health and vitality of stands); traditional forest products (volume of felling and hunting) as well as aspects that have come to the fore in recent years (minor forest products, employment creation, participation in decisions on rural development); and the involvement of forestry both in general-interest protection missions that have long been recognized (soil and water) and in others that have developed more recently (biodiversity).

The current state of scientific knowledge and available inventories makes the concept of biodiversity a difficult one and means that indicators in this connection still require considerable refinement. Work on identifying species that indicate the healthy functioning of a given ecosystem is much more advanced for plants than animals, despite major North American reflection on the question. However, the main difference between the choices
of the two processes hinges on the seventh criterion on the Montreal list - institutional aspects which do not appear on the European list. These aspects have long been taken into account in forestry in countries adhering to the Helsinki Process, and they reflect a national and cultural balance in Europe where pragmatic considerations take precedence over the kind of theoretical consistency that countries with more recent institutional forestry traditions would perhaps tend to emphasize.

No list of criteria and indicators can be used to evaluate and conduct a forestry policy without a reliable and consistent mechanism to measure and evaluate the indicators adopted. A permanent or periodic forest inventory is indispensable, but there is also the question of indicators that fall outside the usual scope of traditional inventories. In some cases, forest inventories must be developed in order to take these into account in terms of measurement in the field, how statistics are treated during data processing and the use of new instruments such as geographical information systems. In other cases, however, it would be too expensive and inefficient to provide forestry services with sophisticated new measurement instruments especially if there are highly qualified specialist services, which is often the case for monitoring water quality or animal biodiversity.

This should encourage foresters to expand cooperation with services with which they have had very little contact in the past and, furthermore, it will develop a new awareness of the impact of other policies on forests. Such a choice develops new working methods, requires an understanding of possible lines of cooperation and means that this new situation will be taken into account in the relevant international processes, especially within the regional offices of FAO. It enabled France to publish a list of national indicators for sustainable management as early as April 1955.
Old forestry countries have sets of statistics going back a long way which provide a valuable record of methods and definitions. As always when new international concerns appear, there is much discussion focusing on the attempt to standardize definitions and inventory methods, despite the failure of numerous previous attempts. In the present context, it is essential that the publication of indicators should always give the source of figures and the methods of calculation used in the case of indirect estimates in order to provide a public guarantee of the reliability of the figures and sometimes to specify limitations to their interpretation.

Standardization is in fact vital in only two specific cases: for those advocating a supranational forestry policy (for example in a union framework for member countries of the European Union); and for those seeking to establish a consistent international mechanism for eco-certification supervised by a central authority. In the first case, the solution would have to entail payment for a supranational inventory parallel to national inventories and allowing a sufficient period for the old set of data to be replaced. In the second case, a normative approach based on absolute values and with no standardization of definitions or inventory methods can very soon create difficult issues concerning equity between the countries involved basically the wood-exporting countries not to mention equity between exporting countries subject to examination and importing countries.

1.10 Cultural Aspects and The International Dimension

In democratic countries where public opinion exerts a strong influence on political decision-makers, experience during negotiations over these lists has shown the importance of the cultural elements involved in the wish to take both issues 1 and 2 into account. Forestry is both a science and an art, and these two aspects cannot be separated; expertise and knowledge based on
sometimes centuries of experience play an important role in the approach adopted by each country and each forestry tradition, although it is not always clear how much comes from practical experience and how much is a result of cultural values and judgement systems. The way that public opinion and NGOs see forests is also influenced by a given society's cultural values, concern over the future and relations with nature (albeit an imaginary rather than a real nature), and political decision-makers have to take this into account. It is thus inevitable that any articulated reflection or negotiations on criteria and indicators for sustainable management will be governed both by biological reality and by the way a given society views it under the imperfect control of available scientific information and economic constraints.

It would therefore seem pointless to hope that criteria and indicators for sustainable forest management could be anything other than the fleeting consensus of an international technocracy if such lists are jointly negotiated by countries that do not feel they have a common future, let alone a common cultural outlook, even if care has been taken to check that they have similar environmental, economic and social conditions as concerns the forestry sector. However desirable it may be, it is unrealistic to hope to negotiate a single worldwide list of indicators for sustainable forest management.

On the other hand, it would be productive to encourage similar countries to join forces in order to draw up and implement such lists in the framework of open processes that allow each person or group (forest professionals, scientists and NGOs), whatever their country, to share its experiences and give public warnings against choices that do not pay adequate attention to available scientific knowledge and the common interest in assuming joint responsibility for the biosphere. Respect for the guidelines that would result from this would already represent considerable progress. Mutual
recognition of these lists would in itself show the political intention of every country to move in the direction indicated in the Declaration of Forest Principles.

Unless this takes place, progress on criteria for sustainable management may indeed be made after long drawn-out technical and political negotiations, but such an agreement is not likely to go beyond a very limited group of traditional forestry indicators, unless the consequences of contemporary reflection on sustainable management are taken seriously. Another possibility would be to let scientists draw up such lists on their own, but this ignores the shortcomings of scientific knowledge in the forestry sector, the slow speed at which scientific consensus tends to be reached, the very uneven distribution of researchers in different parts of the world and the fact that scientists are not culturally neutral when asked to transform knowledge into expertise.

The last possibility would be to leave economic forces free licence concerning eco-certification, letting buyers and sellers fight it out and letting donors impose their own criteria and indicators when negotiating the terms for development aid. In the case of many such solutions, it is clear that any instrument that might have helped the practical pursuit of progress in sustainable management would be robbed of its attraction for those concerned.

1.11 Conclusion

Political geography when viewed and considered in terms of spatial analysis of political phenomena to any political phenomena or any aspect of politics is considered as a suitable topic of politico-geographic study with territorial component, and the techniques of spatial analysis has made this
subject far more relevant in today's world scenario and especially so for the present study of environmental issues in the management of temperate forests in the Nordic region, which thus, going to do a critical spatio-political analysis.

An approach in terms of criteria and indicators for sustainable forest management offers such a good response to a whole series of negative developments in modern-day societies, including a wide variety of requirements, that it cannot be seen as a passing fashion in international forestry. Over the past four years, some exceptionally rich and stimulating work has produced solid gains, but has also raised many thorny questions that technical and political exponents are not yet in a position to solve. However, the development of forestry policies in many countries where forests play a major economic, environmental or social role will depend to a considerable extent on these answers.