ForEcoIndia

Forest Ecosystem Restoration Campaign

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ForEcoIndia

FOREST ECOSYSTEM RESTORATION CAMPAIGN (ForEcoIndia)

Objectives

ForEcoIndia is a campaign or movement that will

1. Promote ecosystem based forest management;
2. Strive to support restoration of degraded forests with an ecosystem approach;
3. Undertake advocacy for restoration of degraded ecosystems to bring them close to nature;
4. Organize and manage awareness drives for promoting forest management on an ecosystem basis; and
5. Mobilize support for this cause from all interested persons, groups and organizations.

Principles

ForEcoIndia stands for the following principles that should govern the forest management in India:

1. Restore degraded forest ecosystems mimicking nature.
2. Discourage continuation of shelter wood system of management.
3. Discourage/ abandon totally coppice system of management.
4. Conversion of coppice forests to high forests.
5. Promote selection system of forest harvesting/ harvesting based on control method.
6. Promote replacement and enrichment of degraded exotic species monoculture plantations by mixed indigenous species.
7. Promote mixed indigenous species plantations.
8. Soil condition should be improved by preventing extraction of dry and fallen leaves and twigs. Soil moisture conservation methods should be applied in all tropical areas.
9. Chemical fertilizers and pesticides should not be used in public forests or plantations on forestlands.
10. Unregulated grazing should be replaced by regulated rotational grazing in forests.
11. Unregulated and indiscriminate collection of firewood by cutting small trees, saplings and lopping should be prevented. Management should be modified to provide regulated alternatives to the dependent communities.
12. Promote Social Forestry/ agro forestry.
13. Shrubs, herbs, grasses, small size trees, undergrowth should not be removed indiscriminately.
14. Site-specific plans should be prepared for restoration of degraded ecosystems.
15. Also, soil and moisture conservation methods should be an integral part of afforestation/reforestation operations. It will also increase biomass productivity.

Action Plan

The proposed 5-point action plan will include the following methods:

1. **Communication and dissemination.**
   Seminars/conferences/symposia/workshops; Awareness raising activities; publications; use of media.
2. **Advocacy and lobbying.**
   Meeting and lobbying with individuals, groups and organizations exercising authority in forestry and building alliances to influence management on ground and at policy and decision level.

3. **Networking.**
   Building alliances with like-minded individuals and institutions supportive of the cause to further the objectives of the campaign.
4. **Research and studies.**
   Case studies and evidence based research to support the ecosystem approach.
5. **Capacity building of stakeholders**

Possible sources of Funds

- Sponsorship for specific events/ publications/Research
- Members contribution
- Voluntary contributions
- Public and Private sector

A Paradigm Shift to Ecosystem-based Forest Management

2. State of India's Forests

1.1 The serious challenge is how to arrest further degradation of forests and how to restore degraded forest ecosystems. Systematic forest management started in India in mid-nineteenth century during the British colonial rule. The forests as we see today are a result of more than 150 years of management intervention. Despite huge pressure on forests from heavy logging for revenue generation, unregulated grazing, fuel wood extraction and timber thefts, the Forest Departments have been able to save 77 million hectares of forest land from complete conversion to non-forest land use as well as huge volume of growing stock of trees, other vegetation and wildlife. However, the serious challenge faced today is how to arrest further degradation of forests and how to restore degraded forest ecosystems at a high speed to sustain forest cover and values for future generations.

1.2 Not more than 5 percent of forests are fully stocked. The Forest Survey of India, an agency of the Government of India, carries out monitoring of forest cover in India every two years. The crown density is used as a basis of classification of forest cover in designated forests (state owned). The following table shows the forest cover with different crown densities.

Table: Forest area crown density wise

Forest Cover	Density range (percentage)	Million ha	Percentage
Very dense forests	70-100	8.3	11
Moderately dense forests	40-70	31.9	43
Open forests	10-40	29.6	40
Scrub	00-10	4.1	6
Total		**73.9**	**100**%

(Source: FSI (2013)- State of Forest Report)

1.3 This shows that open forests and scrubs constitute 46% of forests area where crown density is less than 40%. Only 11% forests are dense with crown density above 70%. Moderately dense forests have crown density 40 to 69 percent. The degraded forests are 46% and forests above 40% density are 54%. In other words 89% forests are poorly stocked. These are highly degraded. It can also be assumed that not more than 5 percent of forests are fully stocked. One should be cautious about accepting merely crown density as an indication of forest health and stocking.

1.4 The vast majority of forests areas are characterized by:

1. Over all poor stocking
2. Absence or lack of adequate natural regeneration
3. Scanty undergrowth, shrubs and soil cover
4. Absence of fertile top soil and organic matter
5. Eroded soil, sheet erosion and rill and even gully erosion in many localities
6. Low proportion of younger age trees
7. Altered species composition
8. Heavy grazing by local and migratory cattle
9. Failed or low survival of plantations
10. Monoculture plantations vulnerable to pest and pathogen attack
11. Depleted biodiversity

1.5 **In India forests are not being managed on a sustainable basis**. It has been impossible to maintain ecological integrity of forests for the following reasons:

1. Past management practices focused on a single objective of wood harvesting.
2. Forest areas that were heavily logged over in the past did not regenerate though it was assumed that forest regrowth would take place naturally.
3. About 89 % forest ecosystems are in varying degree of degradation.
4. Heavy grazing by livestock in forests indicates that legally designated forests have pasture or range as the de facto primary land use and forestry is a secondary land use.
5. Indiscriminate Fuel wood extraction by rural communities disturbs forest health and ecological integrity.
6. Forest boundaries are not legally sacrosanct. Forestland encroachment for agriculture is common.
7. Leaf litter on forest floor is collected for domestic energy or manure.
8. Lopping is done for fodder, fuel wood as well as for green manure or composting material.
9. Man induced forest fires are common.
10. Forest restoration through reforestation and afforestation could not keep pace with deforestation and forest degradation.

1.6 **The objective of only yield of timber was given priority. The yield was neither sustainable nor in perpetuity.** The forest health and well being were implicitly included as objectives of forest management through a working plan system, emphasizing sustained yield management along with conserving soil, fauna and flora and wildlife. These objectives were not given adequate attention in the implementation of management plans and the objective of only yield of timber was given priority. The yield was neither sustainable nor in perpetuity. (Khan,1987)[1]. According to Khan (1987)[2] while managing forests for timber harvesting, attention was not paid to dependence of communities and other land use of forests like livestock grazing, domestic energy and livelihoods. The native population was used as labor force and not stakeholders. This was a colonial syndrome as land belonged to ruler who could do as it pleased. The concessions or rights were treated as servitude. The feudal system that perpetuated poverty, hunger and slavery disenfranchised millions of forest and fringe forest dwellers from their age-old rights and privileges over nearby forests. However, the increasing population and unlimited demand and urge for consumption of forest based resources, in any case, would have destroyed forests beyond recovery.

2. Impact of past management

2.1 The classical forest management philosophy did not take into account ecology, multiple use forestry, local rural livelihoods and a long-term vision. The Colonial rulers carved out forests from wastelands and the local rulers claimed control over all land that was forested but not owned by

[1] Khan, Irshad (1987) Wastelands afforestation: techniques and systems. Oxford and IBH Publishing Co. New Delhi, India.
[2] ibid

anyone. While doing so though the British ruled provinces undertook the process of settlement where only rights of settled villagers were inquired into and not of landless nomadic tribes who depended on hunting and food gathering. The objective of the imperial administration was to mine timer for shipbuilding and later for laying a railway network in India. The natural forests were a good source to harvest commercially valuable timber species. Thus the main objective of forest management was to harvest timber and also convert mixed species tree stands to a single species even-aged forest. The basic management principles were brought from Franco-German forestry practices and the silvicultural and management systems introduced in India heavily relied upon assumptions that any logging will be followed by natural regeneration and that yield of timber would be available in perpetuity. This management philosophy did not take into account ecology, multiple use forestry, local rural livelihoods and a long-term vision.

2.2 Working plans were produced to assess growing stock and estimate allowable annual cut (yield) of timber. With the above objective, a planning system was developed where working plans were produced on a ten years cycle to assess growing stock and estimate allowable annual cut (yield) of timber. This was also reflected in forestry training in that the principles of agronomy were borrowed and forests were termed as "crops". Forestry personnel were trained in the art of logging, growing forest crops, forest industries, building infrastructure (road, culverts, small bridges and small buildings) in remote forest areas, and protection of forests from timber thieves, pests, insects and pathogens. This philosophy was also reflected in forest laws and policies starting from 1892 onward. That was the time when human population was not much and forests and land were assumed abundant and that these were to be used as much as possible.

2.3 The management adopted the following silvicultural systems:

1. Uniform system or its variant or seed tree system or shelter wood system
2. Selection system/group selection system
3. Clear felling with artificial regeneration
4. Coppice system/coppice with reserve/coppice with standards

2.4 The objective was to harvest timber on a sustained yield principle and get natural regeneration or plantation in clear-cut areas. A certain number of seed trees were retained after major felling and commercially valuable species were favoured with removal of other tree species in shelter wood system. Same approach was under selection system where trees with minimum exploitable diameter were harvested. The selection system proved liquidation of trees of higher diameter classes belonging to commercially marketable species(example, Himalayan pine forests). Clear-cut areas sooner or later became barren due to lack of protection and maintenance of plantations with required inputs. All these operations coupled with heavy and unregulated fuel-wood extraction and grazing resulted in degradation and depletion of forest resources across the country.

2.5 The main role of the state forest departments (SFDs) was to generate maximum and increasing revenue for the state. After the country attained independence in 1947, same colonial policies were followed and cash strapped states demanded more and more revenue from the forest sector. The main role of the state forest departments (SFDs) was to generate maximum and increasing revenue for the state to satisfy state finance deportment's revenue target. The financial resources in most states for development of other sectors came from the forest departments without a corresponding and much needed investment for the improvement of forest resources.

2.6 Two developments changed course of the history of forest management- one the Forest (Conservation) Act 1980 and, two the Supreme Court Orders in Godavarman vs. Union of India case. This trend continued relentlessly throughout 1950s to 80s. As a protest to reckless destruction of forests, a nascent environmental movement created significant public awareness against tree cutting. *Chipko* movement in UP hills and Silent valley movement in south were expressions of growing awareness about environment. Later two developments changed course of the history of forest management- one the Forest (Conservation) Act 1980 and, two the Supreme Court Orders in Godavarman vs. Union of India case. With the slow down and even cessation of indiscriminate logging operations in some states and regulated forestland conversion to non-forest uses, the business as usual stopped. However, the damage had already been done and forest degradation continued.

Forests became degraded, conflicts over this resource exacerbated, and socio-political forces superseded conservation ideals rendering sustainable forest management a dream.

3. Current policy and management approach

Policy

3.1 The objective of reversing or even further halting deterioration of forests poses a serious challenge to not only the practitioner of forest management but for the nation as a whole. As a collective national conscience, this generation is failing in leaving healthy natural resource for future generations. Sometimes democratic institutions guarantee a healthy natural environment and natural resources (though in a long run) and sometimes with poor governance they become instrumental in their destruction. Under various orders of the Supreme Court of India, there is ban on cutting of green trees in the Himalayan region. The Court directives have also imposed ban on harvesting of timber without ensuring regeneration or replanting as well as harvesting without a valid working plan of the related forest division. Harvesting of plantations, however, is permissible. The Supreme Court's directives were issued from time to time as the executive failed to implement its own policies

3.2 National Forest Policy of 1952 could not be successfully implemented. This is evident from the preamble to the National Forest Policy of 1988 (current policy), which acknowledges that

> "Over the years, forests in the country have suffered serious depletion. This is attributable to relentless pressures arising from ever-increasing demand for fuel-wood, fodder and timber; inadequacy of protection measures; diversion of forest lands to non-forest uses without ensuring compensatory afforestation and essential environmental safeguards; and the tendency to look upon forests as revenue earning resource."

3.3 The forest policy ideals have not been adequately supported by actions on ground. The Policy reiterates the goal of 1952 policy of 33 % country's land to be put under forest. This aspirational goal remains a distant dream. The forest policy gives supremacy to environmental considerations in forest management and all other objectives have been made subservient to it. How far the ecological goals have been achieved is a matter of debate. Secondly, policy stipulates that people have first charge on forests and their bona fide needs from forests should be satisfied. These ideals have not been adequately backed by actions on ground. The policy stipulations relating to grazing, rights and concessions could not be successfully implemented in most states and it has been business as usual. Also, the goal to enhance forest productivity has, by and large, been not achieved as is evident from the successive reports of the Forest Survey of India. Conversion of forests to non-forest uses continues with increasing demand for forest clearance for mining and infrastructure development.

Forest Ecosystem degradation

3.4 Despite the conservation centred policy and massive afforestation and reforestation efforts the forest degradation could not be arrested or reversed. The main causes (consequent to increase in population and rising socio-economic expectations of the society) of forest ecosystem loss and degradation are discussed below:

1. Deforestation

1. Conversion of forestland to non-forestry uses
2. Clearance for urbanization
3. Clearance for infrastructure development-roads, railway lines, dams, transmission lines, irrigation canals, water reservoirs, etc.
4. Mining of ores and minerals (coal, lignite, copper, bauxite, iron, zinc,), limestone
5. Quarrying of stones
6. Settlement of displaced persons
7. Government buildings
8. Industries

2. Degradation

1. Heavy exploitation of commercially important species
2. Commercially oriented forest management involving clearance of mixed forests and its replacement by planting of single species
3. Management with heavy reliance on (anticipated) natural regeneration
4. Low investment in regeneration or forest restoration after harvesting.
5. Human population growth resulting in increased demand for forest products
6. Tragedy of commons
7. Poverty- forcing people heavy dependence on
    a. Wood as domestic energy; Wood extraction for fuel wood or small cottage based industries, tea leave curing, tobacco curing,
    b. Free and unregulated livestock grazing,
    c. Unsustainable and destructive selective NTFP harvesting
    d. Shifting cultivation
8. Forest fires almost all human caused

3. Policy and market distortions. Policies of distributing timber free or at concessional prices involved increasing demand and created political pressures to meet these demands by excessive harvesting. NTFP collection barring a few species had been allowed unregulated and free that has not only resulted in unsustainable harvesting but also disappearance of many species in many areas.

4. Inter-sectoral or cross-sectoral policies. Policies of other sectors have had and continue to have serious adverse impacts on forests. For example, the policy of livestock sector that promotes increase in population of sheep, goats, cows and other cattle puts increased pressure of grazing in forests without appreciating the carrying capacity or availability of fodder and pastures. Mining, infrastructure and agriculture are other major sectors that involve forest clearance.

5. Institutional Capacity. Policies and law have been implemented half-heartedly partly due to lack of resources and partly due lack of political will resulting in absence of desired outcomes. Inadequate organization capacity of state forestry institutions also creates detriment to effective management of forest resources.

6. Land Tenure. Land tenure issues, pending settlement process in some areas, demarcation, mutation in revenue records and partial implementation of Forest Rights Act have been affecting forest management. Land tenure in many areas is still not settled that allows illegal occupation of forestland and change of land use.

7. Political support and alliances. One discouraging fact is that both Central and State Governments have always given low priority to the forest sector in socio-economic development agenda except in the decade of 1980s when conservation movement got support of the central government. During this period substantial funds were made available for forest development and conservation, Forest (Conservation) Act and a new Forest Policy were promulgated and people's participation in afforestation and reforestation encouraged. However, as of now the forest sector does not enjoy any noticeable political support or clout as well as alliance with media, civil society, politicians, bureaucracy or public at large. This isolation and even an apparent contempt for forest departments is a serious constraint for the last more than 5 decades having a detrimental influence on forest management.

Current forest management

3.5 Forest productivity has declined over years so has harvesting of forest products. Current Management of forest is mixed one focused on conservation and harvesting of forest products on supposedly sustained yield basis. Forest productivity has declined over years so has wood harvesting. Bulk of timber, pulp and even finished furniture used in India are imported from other tropical countries like Malaysia and Indonesia. The principle of sustained yield has almost been unsuccessful due to failure to sustain long-term productivity of forests. The non-timber forest products have been subjected to selective destructive harvesting resulting in depletion and even total extinction of certain species from certain localities particularly those the roots or tubers of which had commercial use.

3.6 The condition of most forests, which have been under regular management for a long time, is that they are heavily degraded and have middle aged and a few mature trees, with little or no

regeneration, absence of young poles and understory, eroded soils devoid of humus and organic matter, dry land with no moisture contents (most of the year) in soil. Probably these forests have been harvested repeatedly at short intervals without allowing the system to reach full maturity and nutrient cycling. All this makes these areas highly vulnerable which are slowly turning into aridity; it is just a matter of time when these lands will become desert. Forests are open to unregulated heavy grazing, grass cutting and fodder lopping. Leaves are swept in many areas from forest floors impoverishing the site in organic matter and soil nutrients. Topsoil is washed away during rains due to unprotected soil surface by vegetative cover. Biodiversity in forests is declining and except a few, most protected areas (PAs) are not being managed actively due to lack of funds and staff. PAs are not being managed as ecosystems but are being preserved for a particular mammal or bird species e.g. tiger, elephant, bison, rhino and lion.

4.An Ecosystem Approach to Forest Management

4.1 The classical forest management has to shift to an integrated and holistic management based on sound ecological principles. The forests should be managed as ecosystems where all elements and their functions and biogeochemical processes are allowed to continue to maintain ecosystem functionality and integrity. The focus should not only be on trees but also on shrubs, climbers, herbs, grasses, fauna, micro fauna and flora, soil, soil nutrients, soil moisture and the fringe human habitations that affect the ecological processes and are at the centre of ecosystem management.

4.2 Two new demands on forests that have come recently are-biodiversity conservation and climate change mitigation (carbon sequestration). We do not know what may be the new demands on forests in future. This requires that forest ecosystems should not be disturbed beyond recovery and their integrity must be maintained while using their services on a sustainable basis for the benefit of society.

Ecosystem management Principles

4.3 The United Nations Convention on Biological Diversity (1992) approach to ecosystem-based management is that:

> Ecosystem and natural habitats management seeks to meet human requirements to use natural resources, whilst maintaining the biological richness and ecological processes necessary to sustain the composition, structure and function of the habitats or ecosystems concerned. Important within this process is the setting of explicit goals and practices, regularly updated in the light of the results of monitoring and research activities.

The IUCN defines it as a

> "process that integrates ecological, socio-economic, and institutional factors into comprehensive analysis and action in order to sustain and enhance the quality of the ecosystem to meet current and future needs".

4.4 CBD parties have agreed in 2005to the following description of an ecosystem approach:

> The ecosystem approach is based on the application of appropriate scientific methodologies focused on levels of biological organization, which encompass the essential processes and interactions amongst organisms and their environment. The ecosystem approach recognizes that humans are an integral component of ecosystems.

Forest Ecosystem Management

4.5 Worldwide, the forest management practices are currently undergoing the most thoughtful, intense and swift change since their beginning in 19th century. The shift from the principle of sustained yield management of quite a limited number of marketable tree species to the sustainable management of forest ecosystems is transforming some of the basic historical forest management principles. The approach to looking at forests for trees or wood is no more valid today when it has been established that forests provide important ecosystem services and any interference with the biogeochemical processes in a forest ecosystem and alteration of its structure and functions destroys the ecological integrity with serious repercussions on abilities of these ecosystems to provide goods and services to present and future generations of human societies.

4.6 The central goal of ecosystem management is sustainability, where the emphasis is on delivering ecosystems services for current use without compromising the ability to provide them in the future. A fundamental aspect of this is the need to protect sources of resources (ecosystems). To use a banking analogy, traditional economic approaches have been living off nature's capital, whereas a sustainable economic model based on ecosystem management is an attempt to live off nature's interest. This reflects the need to shift away from resource management towards ecosystem management.

Sustainable Forest Management and Ecosystem-based Management

4.7 Sustainable Forest Management (SFM) focuses on production of goods from forests mainly timber. Ecosystem management of forests is more holistic in its application and considers environmental services with focus on maintaining ecosystem functioning. SFM was originally intended to integrate ecological, social, and economic values. However, this integration has not been done effectively anywhere. With a view to implement SFM effectively, it is essential that a sound strategy for forest management, including goals, indicators, and performance measures, is adopted that becomes the basis for policy and management decisions. The strategy can provide a clear guidance for making critical decision about managing forest resources. However, such a strategy either does not exist or is not implemented and the primary objective of forest management remains the maximization of timber harvest at minimum cost while protecting environmental values. India's forestry institutions worked on criteria and indicators of SFM. However, it has not been practiced in its true sense. The current approach to SFM does not ensure sustainability. There do not appear to be many examples to demonstrate successful SFM.

5. Close to nature forest management (CNFM)

5.1 The management of forests "closer to nature" has increased significantly in recent decades. The "nature-based silviculture" or "close-to-nature forest management" approach in Europe or 'ecosystem management' and 'adaptive management' in North America trends aim at improving current forest management practices so that they are still profitable, but more environmentally sound and even more sensitive to the complexities of nature conservation and the multiple, varying and steadily increasing demands of society by mimicking natural forest structures, their processes as well as their dynamics. The management of forests "closer to nature" has increased significantly in recent decades simultaneously accompanied by ever more reliable and refined models, promoting its efficient implementation. The basic idea is to reach a better balance between productive, protective and social functions. Other important goals are to increase economic competitiveness by cost reduction and increase robustness to climate change (Larsen, 2012)[3].

5.2 "Close to Nature Forestry" or "Nature based Forestry" philosophy emerged in Europe as early as in 19th century through writings of eminent foresters. The clear cutting and replanting with monoculture of conifer species in Europe was most prevalent management that started in early 19th century. It witnessed site degradation, frequent windbreaks and outbreak of pest and disease attacks that caused huge damage to Spruce plantations in Switzerland. Switzerland shifted to close to nature forestry in late 19th and early 20th century (Larsen, 2012)[4]. During this period India was introducing traditional forestry practices of Europe like uniform or regular shelter wood system for changing irregular forests into regular ones and selection system and its variants and coppice system to cut selectively marketable tree species.

5.3 The nature based forestry movement began in Germany in 1920s. In 1950 a Close to Nature forestry Group was organized in Germany and the group members are foresters and forest owners. The expansion of this movement outside Germany gave birth to Pro Silva Europe in Slovenia in 1989. Twenty-six European countries are its members and USA and Canada have also joined recently. The

[3] Jørgen Bo Larsen (2012). Close-to-Nature Forest Management: The Danish Approach to Sustainable Forestry, Sustainable Forest Management - Current Research, Dr. Julio J. Diez (Ed.), ISBN: 978-953-51-0621- 0, InTech,
[4] ibid

members are foresters, forest owners, students and other interested parties.

5.4 PRO SILVA promotes forest management strategies that optimize the maintenance, conservation, and utilisation of forest ecosystems in such a way that the ecological and socio-economic functions are sustainable and profitable. The general approach to management that is advocated by the PRO SILVA includes market and non-market objectives and takes the whole forest ecosystem into consideration. With reference to sustainability in its broadest sense including all their uses the PRO SILVA (2012)[5] believes that forests provide four categories of benefit to society. These are:

1. Conservation of ecosystems
2. Protection of soil and climate
3. Production of timber and other products
4. Recreation, amenity, and cultural aspects

5.5 The principles of Pro Silva Europe have a universal application. Pro Silva policy is based on a holistic approach to sustainability, covering the major issues of major importance to present-day forest management. These require a standard of commitment from forest owners and forest managers to the following issues: the basic principles of responsible forest management and forest utilisation, the maintenance of biodiversity, the adaptation of man-made changes to environmental conditions related to the ecologically sustainable use of energy, the use of exotic species, and the ecological role of forests in the land scape[6].

5.6 At its Hanover proclamation, Pro Silva Europe acknowledged the role of forests in Climate change mitigation. The proclamation reiterates Pro Silva principles. It mentions that afforestation can be done following the principles of Pro Silva and plantations can be transformed to close to nature forests so that forests become ecologically more sustainable and that change from even aged to uneven aged can be brought about. It also says that financial resources are needed for afforestation[7].

6. Paradigm shift from classical forest management to forest ecosystem management

6.1 ***India should move to an ecosystem approach to forest management applying principles of "Close to Nature Forestry".*** It is obvious from the state of forests that the classical or traditional forest management has become scientifically obsolete and it has been having deleterious effects on remaining and logged over forests resulting in a serious degree of ecosystem degradation. Therefore, there is need to shift from classical management system to a more scientific, integrated and ecosystem based forest management with the objective to restore forest ecosystems and bring forests close to nature.

6.2 India has a vast variation in ecological conditions including soil, climate and vegetation type. All planning and application of the principles and operations should be site specific. Different approaches and methods will be needed for different forest types and varying site conditions in terms of gradient, soil fertility, erosion status, precipitation regime soil moisture, and other environmental factors, local peoples' dependence and protection from grazing. There will also be need to develop on pilot basis site specific plan and model management plans to demonstrate that ecosystem based management can be introduced without drastic changes in management and policies.

6.3 The methods and techniques to be applied to change forest structure and composition to bring it close to nature and introducing a newer version of selection system for continuation of forest cover across all forests in a way that ecosystem integrity remains unaffected and flow of ecosystem services

[5] Pro Silva Principles, 2012, Association of European Foresters Practicing Management Which Follows Natural Processes. Zurich, Switzerland
[6] ibid
[7] ibid

continues on a sustainable basis. When afforestation, reforestation or enrichment planting in degraded forests is undertaken or unsustainable coppice forests are changed to healthy and mixed forests with local species the principles of Pro Silva as applicable to Indian conditions should be followed.

6.4 Paradigm Shift will require acceptance of the new principles by the Government, foresters and society. Forests are owned by states that manage these through their forest departments. The traditional working plan system governs the management of forests and rarely any deviation is allowed though not all prescriptions are followed other than allowable annual cut. The new concept of ecosystem-based management will have to be incorporated in working plans under preparation and those prepared in future. In addition, the MOEF and Forest Departments can issue guidelines for management of forests. It will be a challenging mission, as some people will perceive it as a threat to their long held views, beliefs and conviction in classical management. This is but inevitable and there will be a few early converts but as a campaign is launched and sustained it will draw wide support.

People at the Centre of Ecosystem Management

6.5 A new approach will be desirable to involve local community as well as civil society. The joint forest management (JFM) could not sustain and did not have significant positive impacts on forest resources barring a few exceptions. It has been a project and fund driven activity which became dormant when both these were withdrawn reverting to business as usual. The one extreme view to handover management to communities did not succeed so also another that people should protect forests in lieu of a promised share in forest produce or revenue. The ecosystem management is much more complex than JFM as the target will be to exclude negative influence of people from forest ecosystems and harness their positive energies to enhance ecosystem quality and productive potential. It will be more proactive participation than hitherto administered participation. The Working Plan Code 2014 requires the Working Plan Officer to discuss the management issues with the people.

Forest Governance reforms for Forest Ecosystem Management

6.6 A shift to ecosystem-based management will require incorporation of this approach in policies; development planning and working plan system. The National Forest Policy 1988 lays stress on achieving ecological security and environmental balance. The forestry organizations, therefore, should adopt the ecosystem approach in their day-to-day forest operations be it afforestation/ reforestation or PA management. An assessment of forest governance will be necessary to understand strength and weaknesses and also to identify changes that would be required for implementing the changed forest management activities. Shift to the ecosystem-based management will be a long drawn process. Therefore, the principle of adaptive management should be adopted and practiced so that a flexible process is set on motion and corrections and improvements could be made periodically as the learning curve rises.