Chapter 13
Institutional Dimensions and Changing Role of Forest Management Governance in Dehradun Valley

Poonam Kumria, R.B. Singh, and Koichi Kimoto

Abstract Forests are under intense pressure and the country faces significant timber and fuelwood deficits. There was an intense debate throughout the 1980s as to who could most effectively manage forest resources. Forest are important for rural livelihood. There arises conflict between government institutions and local people who are dependent on these forest resources. The Forest Policy envisages a process of joint management of forests by the state governments and the local people, which would share both the responsibility for managing the resource and the benefits that accrue from this management. But at implementation level village communities have not been involved in forest management because in the valley forests are under Reserved Forest category. Over the past several years the focus in forestry has shifted towards the planning and conservation. Current forest management systems need significant strengthening to monitor forest and community. The study analyses the factors leading to success and failure of the JFM targeting perceptions and operational difficulties faced by forest managers.

Keywords Forest depletion • Social forestry • Forest policy • NTFPs • Forest Protection Committees • Joint Forest Management Committee

13.1 Context of Research

India's compliance with United Nations policy on forests and indigenous people is seriously limited by the centralization of forest management and lack of recognition of indigenous people and their rights, and the situation with regard to traditional

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forest related knowledge can only be understood within this wider context. Widespread resistance to state forest policy and law throughout India's history of centralised forest management has been fuelled by the fact that about 90 % of India's 64 million hectares of forests are under state ownership, the rest being in community and private forests. Moreover, it is predominantly the country's indigenous/tribal peoples' areas that have been declared as state owned 'forests'. Also, state control over the forest land is weak and there is considerable encroachment by individuals and communities other than the indigenous people in state-owned areas (Baland et al. 2007). The tribes were there long before the state started encroaching on their lands and the condition of both the tribal and the forests then were far better than it is today. This rift still can be seen in the valley between officials of Rajaji National Park and Gujjar tribe. However, the laws enacted so far in India have largely ignored the forest dwellers and more particularly the tribal people.

The crisis lies not in the magnitude of the problem but in the inability of the state and social institutions to find solutions. The contradictions within a society undermine social and organizational mechanism, making it impossible to find alternatives for conflicts and crisis. Solutions must be based not only on capital investments, production and technology but also on understanding and agreements. The inequalities-individual or spatial, urban-bias central authority, and production system with low rate of labour absorption, is responsible for increasing dependence of population on natural resources (Arizpe et al. 1994). Forest has the history of the inter-twined, ever-interacting system of the state, forest and people living close and in the forest. The forest dwellers represent the societies insist on subsisting on their local resources and the state represents the forces of modernization, which control the resources. The change in forest resources affects both the state and the people. The crisis is not only of the depletion of forest but of the relationship among state, people and the forest (Pathak 1994). The concept of people's participation in management of forests is not new to India.

The country historically has great traditions of protecting and managing forest as common resources. Every village hamlet and community ensured that the utilisation of natural resources including forests did not exceed the ecological carrying capacity (Guha 1989). The economic and political colonization of the country adversely affected the traditions of conservation of sustainable utilization of resources (Gibson et al. 2000). The forests and the people, which grew under the mutually beneficial relationships, suffered together, as the growing population put ever-increasing demands on the resources (Agarwal and Chhatre 2006). The Millennium Development Goals call for the integration of the principles of sustainable development into the forest policy. Environmental sustainability is being mainstreamed in forest policies around the world, particularly since UNCED, while the integration of the goals of poverty and hunger reduction in forest policies and plans is less widespread (www.legalserviceindia.com/article/1215)

13.2 Methodological Considerations

Dehradun district lies in the state of Uttarakhand, which is carved out from Uttar Pradesh in November 2000. The state was carved out from Uttar Pradesh taking out 13 districts covering an area of 53,483 km^2. The state of Uttarakhand recorded 13 districts, 49 tehsils, 86 towns and 16,826 villages. The population of the State as per 2011 census is 10,116,752. The decadal growth was 19.17 % while previous decade it was 19.20 %. According to 2011 census, the Dehradun is the second largest district in terms of population (1,698,560) after Haridwar district (1,927,029). It is one of the highly populated districts of the state. It has highest literacy rate in the state. The valley is bounded by the lesser Himalaya in the North and Siwaliks in the South, while rivers the Ganga and the Yamuna form eastern and western limits. Within the valley the elevation ranges between 315 and 1000 m. Dehradun is a longitudinal valley lying between 29° 55′ and 30° 30′ N latitude and 77° 35′ and 78° 24′ E longitudes. Its length is 100 km and width varies from 20 to 25 km covering an area of 2250 km^2 (Fig. 13.1).

The wide altitudinal variation ranges from low lying valley to the Himalayan ranges, leading to variation in lithology and topography; it results in variations in climatic and edaphic conditions. It has produced great variety of vegetation. In the valley about 48.62 % of the land is under forest and about 24.08 % of the forest land is of open category. The changes in vegetation cover not only affected by human presence but also by the physical factors operating in an area.

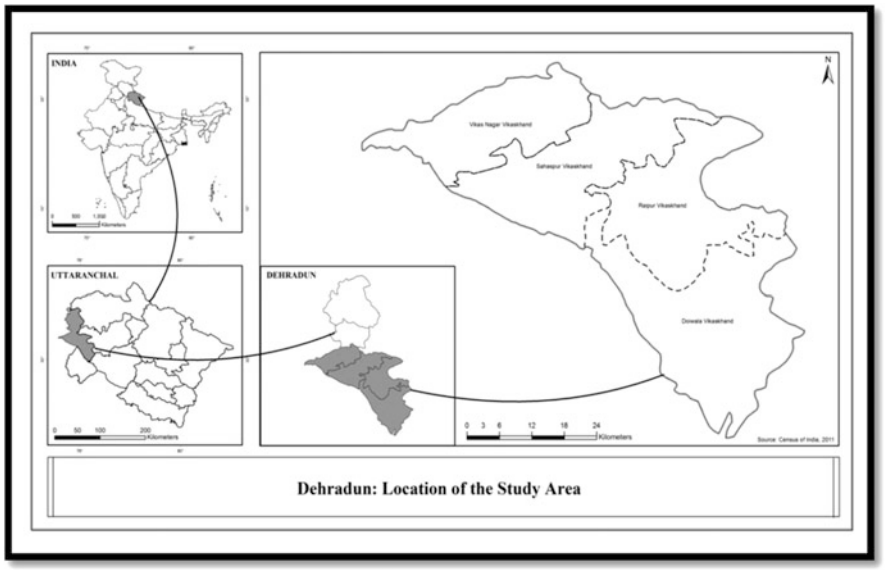

Fig. 13.1 Location of the study area

The research methodology of this study includes data generated from the field through structured as well as unstructured questionnaire. In total 80 forest officials and scientists have been consulted on these issues in order to develop comprehensive framework for sustainable forest management. The unstructured questionnaire and field book has been maintained for policy makers regarding – financing the poor people, perception of people about social forestry, forest action plans, local community participation in these programmes, etc. Simple statistical techniques and diagrammatic representation is also done.

The non-parametric Chi Square test have been performed to analyse the distribution of responses given by the forest officials. The test has been calculated with the use of SPSS 12. It was assumed that responses of forestry staff would be uniformly distributed across different response categories because all of them follow the same procedures, rules and regulations of forest management and JFM. Chi-squared goodness-of-fit tests were used to examine whether responses of forestry staff differed across the various response categories, at the 5 % significance level. The response categories chosen for factors of success and failure of Forest management were: AG: Agree, ASE: Agree to some extent; N: Neutral and DA: Disagree. The assigning importance weights to response categories has also been done in descending order of importance (AG: 4, ASE: 3, N: 2, and DA: 1). For each question, the number of respondents assigning each particular importance level were multiplied by the corresponding weights and these were summed to obtain the total score.

13.3 Unlocking Forest Policy

In ancient India it was generally accepted that forests and the communities living in the forest were not controlled by the rulers, because the forest was not seen as a source of revenue or commercialisation. The effects of industrialization side by side with British rule in India in the eighteenth century brought about dramatic changes: the need to meet the growing demand for timber (associated with the expansion of trade and commerce as well as the railway boom of the late 1800s) and a growing dissatisfaction with the legal restrictions imposed by previous legislation, led to the institution of the Indian Forest Act in 1878, according to which the nation state was recognized as sole proprietor of classified forest lands. The first Forest policy 1894, failed to lay down the guidelines of the proper utilisation of the Indian forests (Jha 1994). A new Indian Forest Act in 1927 incorporated few substantive changes over the 1878 Act, and remains the legislative basis for state forest management today (Table 13.1).

Joint Forest Management is a forest management strategy under which the Forest Department and the village community enter into an agreement to jointly protect and manage forest land adjoining villages and to share responsibilities and benefits (MoEF 1990). The village community is represented through an institution specifically formed for the purpose. This institution is known by different names in

Table 13.1 Indian national forest law and policy, 1878–1988

Year	Law	Relevant measures
1878	Indian Forest Act	State is sole proprietor of classified forest lands
1890	Forest Department Resolution	Previous rights of access and use redefined as 'privileges' for specific tribes, castes, villages and organizations
1927	Indian Forest Act	Few substantive changes over the 1878 Act. It remains the legislative basis for state forest management today. The Indian Government adopted the 1927 Act after it gained independence in 1947
1952	National Forest Policy	Set out guidelines which were, for the most part, directed towards the supply of cheap timber and non-timber forest products for state-sponsored industrialization and modernization
1976	Indian Forest Act added to the concurrent list of the Constitution of India	Central government and states given shared control over forest matters
1980	Forest Conservation Act	The central government reasserted some of its control over forest-based resources. The 1980 Act restricts the state government's power to de-reserve a forest, and it restricts the use of forest land for non forestry purposes without the prior approval of the central government
1988	The National Forest Policy	Envisaged people's involvement in the development and protection of forests for the first time, never translated into law

Source: Compiled from MoEF 1988, 1990, 1998

different states (e.g. Vana Samaraksha Samitis in Andhra Pradesh and Hill Resource Management Societies in Haryana) but most commonly referred to as Forest Protection Committee or FPC. In some states, panchayats can also enter into JFM agreement with the Forest Department. Under JFM, the village community gets a greater access to a number of Non Timber Forest Products (NTFPs) and a share in timber revenue in return for increased responsibility for its protection from fire, grazing and illicit harvesting. The details vary from state to state as each state has issued its own JFM resolutions/rules. The essential difference between "social forestry" and JFM is that while the former sought to keep people out of forests, the latter seeks to involve them in the management of forest lands. JFM also emphasises joint management by the Forest Department and the local community. JFM is an outcome of the realisation that active and willing participation of the forest fringe communities is necessary for any forest regeneration programme to succeed. Further, village communities would have little incentive to participate unless they benefit directly and have sufficient authority to be effective (MoEF 2000a).

To promote afforestation, tree planting, ecological restoration and eco-development activities in the country, the National Afforestation and Eco-Development Board (NAEB) was set up in August 1992. The main function

of the NAEB is regeneration of degraded forest areas and lands adjoining forest areas, national parks, sanctuaries and other protected areas as well as the ecologically fragile areas (india.gov.in/sectors/environment). Four Eco Task Force (ETP) Battalions are being supported under the Eco Development Forces (EDF) Scheme. These battalions are located at Pithoragarh, Samba, Bikaner, and Dehradun (MoEF 2000b). Two new battalions have been approved in Assam. All ETF Battalions have undertaken works like raising nursery, plantation and protection measures to protect the plantation area. They have also constructed stone dam as also other soil and moisture conservation works. Besides, the battalions also take up maintenance of old plantations. NAEB also has facilitated implementation of the Centrally Sponsored Scheme, 'National Afforestation Programme' (NAP) through 28,281 village level institutions to realize the dream of Joint Forest Management across the country. These institutions, commonly named Joint Forest Management Committees (JFMCs), are organized into district level federations named as Forest Development Agencies (FDA) which play the pivotal link between the Central Government and the JFMCs for natural resource management. This institutional framework encompasses all States and Union Territories of the country.

The scheme has supported 782 FDA projects in all including 31 projects for special problem areas like 'Jhum'/shifting cultivation. It continues to be the flagship scheme of NAEB, in so much as it provides support, both in physical and capacity building terms, to the Forest Development Agencies (FDAs) which in turn are the main organ to implement Joint Forest Management (www.india.gov.in/sectors/environment/national_board.php). This decentralized two-tier institutional structure (FDA and JFMC) allows greater participation of the community, both in planning and implementation, to improve forests and livelihood of the people living in and around forest areas. The village is reckoned as a unit of planning and implementation and all activities under the programme conceptualized at the village level. The two tier approach, apart from building capacities at the grassroot levels significantly empowers the local people to participate in the decision making process. Under Entry Point Activities, community assets are created with a 'care and share' concept (MoEF 2003).

The Government of India (2009) of the National Afforestation Programme (NAP) are being issued to further decentralise the project cycle management of the Scheme with a view to expedite fund transfer to the village-level implementing organisation, that is the Joint Forest Management Committees (JFMCs) and Eco-development Committees (EDCs), to embed the Scheme in the overall forestry development programme of the State/ UT, build capacity of the institutional actors and institutions, and promote livelihoods of JFMC members by linking forest development to value addition and marketing of forest products. The Scheme will be implemented by a three-tier institutional set-up, namely State Forest Development Agency (SFDA) at the State/UT level, Forest Development Agencies (FDAs) at the forest division level, and Joint Forest Management Committees (JFMCs) or Eco-development Committees (EDCs) at the village level (www.india.gov.in/sectors/environment/national_board.php). The focus of the institutional work is towards regeneration and management of forest resources while strengthening the village level capacity for the same.

The state neglected local people very much in the valley, while changing its priority from commercial extraction to forest protection till now. Although there is a shift in the government policy, the commercial extraction, wood smuggling and collection of Non wood forest products is still going on in the valley causing severe damage to forest stock especially in the settlement areas. The survey conducted among officials of forest departments, and scientists from the forest research organization indicated that many economic, legal, and energy and infrastructural provisions are provided in the policy but their implementation is not hundred per cent. The Forest Department raises plantation of quick growing species on common land and revenue wasteland with the help of panchayat (Jena et al. 1997). It manages the plantation for 3–5 years and then transfers the charge to village panchayat. The village gets grass, branches and twigs free for collaborating with the project. The power structure and the social heterogeneity make impossible for the villagers too have the benefits of social forestry as they are ignorant of the rules and their rights. There is no relation of development planning and presence of the resources in the valley. The encroachment of the forest land is a common feature, which reflects the faulty government policies. The survey indicates that 55 % forest officials responded that there is economic assistance, while only 2 % assistance is there for energy sector. The provision of economic assistance- direct or indirect is given in the policy (over 72% of the responses) but analysis indicates that implementation is only 27 % agreed by the respondents. Similar is the case of legal rights given in the policy. There is less help either in planning process or implementation on energy and infrastructural issues.

Choice of management system is also an important issue. Management can range from deliberate non-intervention to various intensive forms of use (Ostrom 1990). It also varies from management directed primarily at a single end product such as recreation, hunting, or timber to management that tries to satisfy many different user groups – multipurpose forest management. For nearly four decades after independence the process of commercial exploitation and degradation of the forest continued. The importance of forests for the ecological and economic stability of the country was realized by the conservationists, foresters, as well as the government, which necessitated the reexamination of the policy, laying emphasis on the conservation and sustainable utilization of our forest resources (Baland et al. 2006).

13.4 Forest Management

Forest is the overall administrative, economic, legal, social, technical and scientific aspects involved with the handling of conservation and use of forest. It implies various degrees of deliberate human interventions, ranging from action aimed at safeguarding and maintaining the forest ecosystem and its functions, favoring socially or economically valuable species or groups of species for the improved production of goods and environmental services (FAO 1991). It is based on the knowledge of a number of basic subjects, such as silviculture, ecology, geology, geography, pedology, botany, pathology, economics, and finance, etc. (Prakesh and

Khanna 1979). In the past the country had good dense forest. The population growth was not alarming. The demand for the forest products was also within the carrying capacity to which existing forest could sustainably produce. Deforestation was never perceived as a problem. Consequently, management of forest in the pre-independence period focused on following three main tasks:

- Control of composition and structure of the growing stock,
- Harvesting and marketing of forest produce,
- Administration of forest property and personal.

The forest management practices prevailing in the pre-independence India continued till eighties. During this period the relationship between forest and people changed drastically. On one hand, the anthropogenic pressure on the existing forests increased manifold and community control over the common resources weakened. On the other hand, unsustainable harvest and use of forest resources increased by leaps and bounds. Consequently, deforestation rate increased at the alarming rate. So, the focus of forest management changes on the following issues:

- Restoration of degraded forest,
- Development of medium and dense forest,
- Conservation of existing dense forests and its resources.

Restoration of degraded forest requires protection and reforestation. The development and conservation of existing forest requires a mechanism sustainable forest harvesting and accounting of forest stock available in the area. In view of this multiple management of forest becomes very important. It includes protective, climatic, productive, scientific and recreational management. While managing a forest landscape, all such purposes are not equally synchronized. One purpose has to take precedence over the other. However, based on the priority, we can adjust our management objectives. Although till date, in the case of management of dense forest, timber production has received the utmost priority (Bebarta 2002). With the increasing problem of deforestation and rift between the state and people, the management of forest area has become more important. Similarly, the degraded forests are required to be tackled for rehabilitation work on war footing.

Sustained yield has been an age old principle of forest management. The principle of sustained yield envisages that a forest should be so exploited that the annual or periodic felling does not exceed the annual or periodic growth (Prakash and Khanna 1979). The transition from the sustained yield management for wood to sustainable forest management is the main challenge.

The region has an impressive array of community forest management systems, both informal as well as officially constituted. Unofficial community management, with diverse institutional arrangements on all legal categories of forest lands, has co-existed with formally constituted Van Panchayats, and in fact predates them. Democratic and autonomous community management of legally demarcated village forests (on Forest and Revenue Department land) by elected forest councils, Van Panchayats (VPs), has existed in Uttarakhand for over seven decades. The institution of Van Panchayats was created in response to protests against forest

reservation through notification of the Kumaon Panchayat Forest Rules in 1931. Although it has undergone several changes since, it remains a unique example of community based forest management in India possible under section 28 of the Indian Forest Act, 1927 (Singh 1999). These forests are demarcated as village forests under the Act and are entered in the land records in the panchayat's name. All of the van panchayats in the hills, are thus formally empowered to initiate rule making procedures and implements the rules they craft so as to use and protect theri forest resources in accordance with their needs (Agrawal and Yadama 1997).

Various studies have shown that although the effectiveness of Van Panchayats varied from village to village, the condition of panchayat forests has been generally as good as or better than that of Reserve Forests, particularly those near habitations. The early Van Panchayats enjoyed considerable autonomy in decision-making and control over the forest (Bonati 1991). They balanced the maintenance of ecological services such as soil fertility and water source protection with grazing, collecting and other forest uses necessary to support local livelihoods (Somanathan et al. 2005). High stakes in the forest and strong bonds of trust among villagers allowed many of the Van Panchayats to remain successful for many years. Many have displayed remarkable resilience and adaptation to changing internal and external environments. However, the total number of Van Panchayats remained low for many decades, partly due to the weak capacity in many villages to negotiate the bureaucratic procedures for getting a Van Panchayat constituted. Also people saw little advantage in getting village forests notified as they continued to assert customary authority over their commons on the strength of the traditional sal boundaries. Such community forest management continues to be widespread and is growing outside any formal legal framework on all categories of legal forest lands. This is particularly so in villages away from major roads where the commons are still central for sustaining the local subsistence economy. Traditional Lath Panchayats, informal Van Samitis and more recently, increasing numbers of Mahila Mangal Dals are regenerating and regulating the use of reserve and civil/soyam forest lands, often compelling unofficial cooperation by staff of Forest and Revenue Department.

13.5 Forestry Education and Training Programmes

Education and training are vital parts of the forest management. It helps to make aware the community about their rights and different provisions given by the government. It fills gap between the society and forest officials. Although there are lots of training programmes as well as informal meetings and involvement of NGO in the valley, some surveyed scientists feel that these programmes are not successful as there is inherent conflict between people and the state. On the whole majority (over 63 %) of the scientists feels that these programmes are successful in bridging the gap between the people and government to some extent.

The importance of training and education is a constant factor in all the work of forest quality. These programmes work in two way directions, as experts also learn from the grassroot experiences. These training programmes are organised by the forest department for both local people as well as for the staff at various levels. Professional training programmes for Forest Rangers, Foresters and other field staff. Workshops are also organized to make local people aware about different scientific techniques of plantation and maintenance. Tailor-made special training packages are designed for van panchayats, village panchayat and local community. Decentralised training programmes for van panchayats are also conducted in different Forest Divisions. Training on different aspects of wildlife management is conducted at Corbett (Wildlife) Training Centre, Kalagarh. Demand-driven short-term programmes and capsule courses are also arranged. Professional training programmes for Forest Rangers, Foresters and other field staff are being conducted at Forestry Training Academy, Haldwani (Rawat 1999).

The forest practices that are community-based and community-managed often fare better and are more sustainable than those models that are formulated and controlled by the state. This inclusive approach is seen as helping to alleviate the issues of alienation of locals and the disintegration of traditional cultures and livelihoods. Government and business practices do not always respect this, which can lead to unwanted interference. One such obstacle to self-determination in this region is the governmental policy of turning increasing amounts of forest land throughout various parts of India into parks and sanctuaries. The result of this has been the forced resettlement of indigenous peoples from their forest dwelling communities to areas that are outside their traditional habitat. The two way involvement is necessary to stop forest degradation. There are various steps taken by the forest department to assess the stock, loss, degradation, and people perception about the degrading forest resources in the valley.

13.6 Forest Assessment Systems

Access to forest inventory, land use practices, soil erosion area, land degradation, salinity, lowering of water table, farming practices, scientific research are important component of sustainable forest management. Access to this database is very important for planning and implementation of the plan. Sufficient quantum of hardware and software has already been acquired by the Forest Department. Regular trainings are organized for staff and officers. Office staff is trained with primary focus on Word Processing and use of Spreadsheets, etc. Department uses database software in many of its functions like Fire Information Database, Inventory Management System, Establishment database, etc. Department has created a GIS using some data layers like river systems; cities, towns, villages; forest rest houses; roads; territorial entities like ranges, etc. Assessment systems, guidelines, code of practice and technical manuals all help people charged with managing a forest landscape have information about best practice (Dudley et al. 2007). The

Table 13.2 Different assessment systems

Assessment system	Accessibility (ranking)[a]		
	Scientists	Community	Women
Inventory	VH	VH	VH
Scientific skills	VH	L	VL
Scientific research	VH	VL	VL
Latest technology	VH	VL	VL

Source: Fieldwork
[a]*VH* very high, *L* low, *VL* very low

survey with the forest officials indicated that there exists very high accessibility among scientists to various assessment systems for forest management in the valley (Table 13.2).

The community and the local women also have very high accessibility when it comes to the identification of species and knowledge of forest inventory. Forest officials indicated that people in the valley are well versed with the species in their areas. They also know which tree or species should be used for what and when. The local women have more information than men as they have to go forest more frequently than men either for collection of fuelwood, fodder or NWFPs. Their assessment is affected by daily requirement of each household. People's image about environment and resource is also transmitted through their social, cultural background that affect their behaviour and in terms perception. Perceptions are created and recreated by trying to fit them into previous frameworks. These perceptions are transmitted through oral traditions, schooling or the mass – media (Badola 1998). Since, everyone equally has to face consequences of deforestation and degradation, so the responsibility lies with everyone; though, in different proportions. With the use of remote sensing and GIS techniques Forest Survey of India, assess the whole forest area of the country. There are various institutes in the valley which are working on the forest resource assessment in the reserved as well as outside tree areas.

13.7 Evaluating Management Plans

Forest in India are owned and managed by the government. Therefore, the ownership is public in nature. Public ownership of forest enjoins upon the state a responsibility to manage forests is such that it maximizes generation of public goods. With changing policy of forest exploitation to protection of the forest, the perspective of government changes with time. Although commercial exploitation still exists many a times ignoring the people who are very much dependent on the forest resources especially in the valley. A management plan is largely about resolving conflicts, choosing goals, objectives and making decisions. This management plan in forest parlance is called "Working Plan". A working plan is a written

scheme of management aiming at continuity of policy, controlling the treatment of a forest (Government of India 1983). It is the simplest possible statement of what is known about the working plan areas; its configuration, soil, climate, vegetation, its possibilities; what has been done in the past, what should be done in the future, how it should be done and what records should be kept.

The main objectives of Dehradun management plan are still concentrating on commercial exploitation of the timber and other NWFPs as indicated by the Forest Survey of India officials. Objectives of management plan changes with the passage of time in Dehradun Valley. Since the inception of forest management the primary objectives of drawing a management plan was to maximize timber production from the forest. Therefore, working plan aimed at evolving a felling programme so that the entire accessible part of the forest would be taken up for harvesting wood in a definite period. However over the years, in order to obtain sustained yield of timber on a long-term basis, regeneration strategy was incorporated in the working plans.

During this period the methodology of computing the timber projection was basically very rude and was based on thumb rule and cursory observation (Bebarta 2002). Later, the practice of partial enumeration of trees and other improved methods to calculate timber yield were used. This method of enumeration was continued till 1960s. With the advancement in science and technology and application of remote sensing and GIS techniques have changed the whole scenario of enumeration. Now, all over the country, detail inventory of forest resource is done. Over the years, the role of forest changed radically. Timber producing function gradually gave way to societal and protective functions of the forest areas. With the passage of time, even the social values of forest are also changing, leading to host of intractable problems and constraints.

The management plan for Dehradun valley is prepared by the Forest Department, Nanital. The plans are based on the local conditions and problems. The time plan for these is 10 years. After every 10 year, the plans are written again though with few changes in the plans, policies and implementation programmes. The basic structure of the management plans has not changed much since the first plan was prepared in 1888 for the Dehradun valley. It also contains planning and conservation policies and the major objectives that have to be followed during a course of time. There are different issues which are taken care of while formulating the plan. The first volume of the plan comprises of number of chapters discussing geology, geography, soil, vegetation type, and diameter of the trees, exotics, pest control and various other issues (Working Plan Circles 2000). The second volume contains appendices of forest ranges. It contains detail information about area under sal, under chir, under miscellaneous, plantation, etc.

The survey indicates that over 65 % of the forest officials and scientists ranked collection of forest information and soil inventory as first priority in the current working plan. The involvement of local people in the management plan has been indicated as second priority only by 6 % of the officials. In view of people's dependence on forest and non participatory approach, the management plans most of the time fail on implementation part. Forest ecosystem services, such as replenishment of land, sequestering of carbon, protection from weather events, and

recreational uses, remain threatened. The high population growth and poverty accelerate forest degradation and it is a major factor leading to tussle between the people and forest officials. Apart from this, plans are executed for 10 years, any social change or cultural change cannot be accounted in the present time. Consequently, leading to gap in the planning and forest management which, increased rift between forest officials and village people. Proper forest management was started in 1871 when mapping and demarcation of the forest area was started. The valley has gone through 11 forest working plans starting from Fernandez's Plan in 1888. During the British period, the sole purpose of forest management became to redistribute economic gains in favour of the empire (Jha 1994). This was achieved by commercialization of timber, restriction of the rights of local people, and large-scale deforestation (Gadgil and Guha 1995).

The exclusion of local people from forest resources led to conflicts between the empire and local people. Due to heavy pressure of fuelwood demand, illicit grazing, and wood smuggling, the forest degradation increased in the valley. The main objective of forest working plans is to develop the stock in under best possible conditions of growth. The survey indicated that enumeration process is most successfully carried out under these plans. Over 33 % of the surveyed officials think that the success rates of the past management plans are only below 30 %. In the earlier plans the forest continued to improve under improvement felling, climber cutting, coppice of unsound stock etc. The local people searched for a solution through various non-violent movements, although some eventually turned to violent means. Although, some forest were under severe destruction due to uniform group selection system. The improved felling, exploitation of minor products and fire protection is rated as 60–90 % successful in various plans.

The usual tendency to mark the trees even where there is nothing to mark resulted into heavy felling earlier in the valley (Working Plan Circles 2000). There are many experiments like – shrub cutting, burning, ploughing planting of sal transplants has been done with not so success to regenerate degraded sal forest in the valley. All other works are relatively low on the success rate. While the social issues and involvement of local people in the working plans, got very less considerations. Prior to the British occupation the local rulers derived an income from the forest in the form of royalty. There was no control on felling and any one could fell any tree anywhere and export by paying royalty. The system was devoid of conservancy and consisted of colossal destruction and waste of forest resources (Fig. 13.2).

Forest management regimes did not take the cognisance of existing examples of community-based natural resource management such as village ponds, sacred forests, forest panchayat (Van Panchayat), and informal tree tenure for collection of NTFP, and continued regulatory and authoritarian forest management practices (Jodha 1990). This alienated the communities from being a responsible part of the ecosystem, and resulted into unsustainable and destructive harvesting of products and loss of bio-diversity (Arnold and Stewart 1991). Peoples' participation was first experimented with the launch of social forestry programme in mid-1970s. However, at that time "I work and you participate" mindset of foresters did not result into meaningful participation of communities in forest management (Tewari and

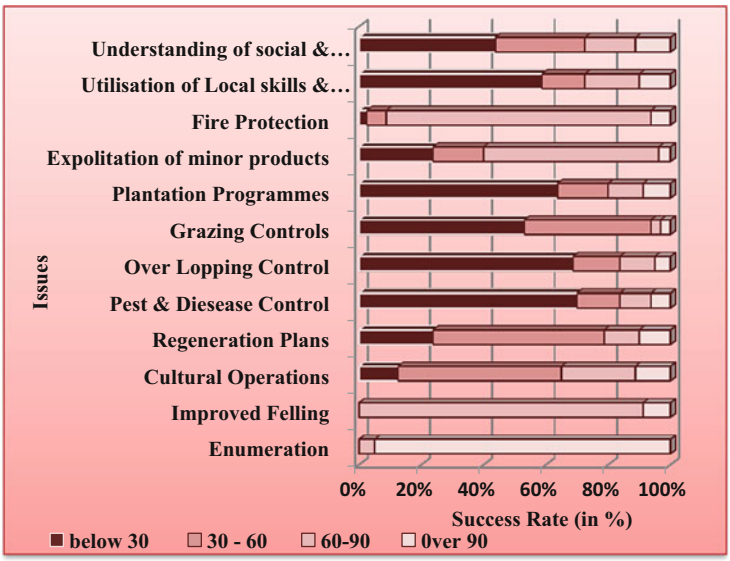

Fig. 13.2 Past management plans

Campbell 1995). In recent years there has been a shift towards participatory approaches in forest management and biodiversity conservation. The Government of India (1988) declared that local communities were to be involved in natural resources conservation. Subsequently, in 1990 the Indian Ministry of Environment and Forests issued a circular for Joint Forest Management (JFM) and resource sharing. The JFM approach seeks to develop partnerships between state forest departments (as owners) and local community organizations (as comanagers) for sustainable forest management (Agarwal 2006). The main stakeholders of JFM are Forest Department and the local people. Other interest groups include NGOs, panchayats (village councils), politicians, local administration, academicians, and environmentalists. It is becoming clear that different stakeholders view JFM quite differently and have different expectations.

Many foresters see JFM primarily as a means to ensure forest regeneration. Communities tend to see JFM as a solution to the growing shortage of biomass, a means to ensure daily requirements of fuel, fodder, food, and other non timber forest products (NTFPs) and/or a way to increase income (Tewari and Campbell 1997). Within individual communities, gender, caste, class, and occupational perspectives also influence perceptions of JFM. NGO activists tend to support JFM as a vehicle for grassroots empowerment, whereas environmentalists favor JFM as a means for ecological revival. The perceptions of other stakeholders may also vary widely (Saigal 2000). This difference in perception and expectation often leads to conflicts over the rights and responsibilities of different stakeholders and the objectives of forest management and silvicultural treatments. As neither the community nor the FD is a homogenous group, a number of conflicts are also emerging within them (Sarin 1993, 1996).

Conflicts also arise due to multifarious and often conflicting functions Forest Department (FD) have to perform. This dichotomy between the FDs' internal culture and their new role leads to many internal conflicts. Many enthusiastic and dynamic officers and staff members get demoralized due to this and start viewing JFM as yet another "scheme." Another linked problem is that of the unsympathetic attitude of some senior officials toward JFM as they see it as a step toward dilution of their powers. They do not openly oppose JFM, but continue to send contrary signals to their juniors, creating confusion in the minds of field staff. The state forest departments also should also initiate planning process to guide internal organizational transformation and rationalization. Local communities should also be able to learn new ideas and techniques. Capacities must be created to develop consensus, transperancy, equity and individual tendency to free ride over nature. JFM requires a shift in attitude as well as new skills in extension, institution building, participatory planning, multiproduct management, conflict resolution, and marketing. These skills are not imparted at the time of training (Saigal 2000).

13.8 Applicability of Scientific Development and Research

The scientific community is now confronted by a twofold responsibility: first, to search and develop new science and technologies appropriate for rural people to raise their productivity; and second, to diffuse and propagate scientific and technological knowledge, thus fostering and training environment-friendly entrepreneurship among rural people, particularly young men and women (Table 13.3).

Well-designed cultivation systems coupled with adequate processing, distribution and sales lend themselves to commercialization and development opportunities will have to take into account the viability of strategic micro-enterprises. Advances in the technologies critical to forest production, management, and engineering, as well as forest products manufacturing, will sustain the jobs and economic health of rural communities while promoting the environment enjoyed by urban communities. The rural poverty can be eliminated by raising sustainable production. This can be done by focusing on diversified commodity production, exploiting local resources of comparative advantage and by disseminating highly efficient and environment-friendly agricultural, silvicultural and industrial technologies. Environment, education, family planning and so forth, however important but it is not realistic to expect people struggling to survive to be concerned about future generations and about conserving nature for sustainable development. Adoption of any technology by farmers largely depends on demonstration and training, transfer of knowledge, awareness generated and level of strengthening of capacity (Somanathan et al. 2006)

The more controversial aspects relate to socio-economic implications, understanding beneficiaries' goals and constraints and the policy and institutional background. Institutional backgrounds can affect, for instance, the sustained supplies of planting materials, an essential component of cultivation system. Similarly, a favourable policy environment with government support can help greatly (Mansuri

Table 13.3 Applicability of scientific development and forestry research

Technology options	Economic[a] efficiency	Ecological[a] sustainability	Social[a] equity
Nursery operations – plantations, and plant protection	9	10	8
Use of chemical fertilizer and pesticide in farmland	8	1	8
Soil and water management	8	10	8
Biotechnology for adapting plants to a specific location	8	10	6
Tissue culture research	8	10	6
Collecting planting material from the wild for cultivation	8	9	8
Gathering raw material from the wild	8	2	8
Cultivation of bamboo, rattan and other economically important species	8	8	10
Cultivation of energy other domestically important species	9	9	10
Creation of fiber farms	5	9	8
Dissemination of knowledge – farmland and industry	3	10	10

Source: Fieldwork
[a]On a 1 (low) to 10 (high) scale

and Rao 2004). Cultivation can readily reduce unwanted heterogeneity and provide better and more controllable harvesting and better quality products. Cultivation can readily be adapted to improve quality and quantity through specific agronomic treatments allowing better control of the cost of products than in the case of wild-collected material where availability; quality and yield are unpredictable (Cernea 1987). The major technology needed is the cultivation of priority species as the only major alternative to harvesting plants from the wild. It is an integral tenet of farm and social forestry where the least controversial aspect is the biological and agronomic practices. Essentially, the basic principle is to identify useful species suitable for a range of soils and ecologies, develop suitable propagating systems and cultivate the plants in suitable systems. Much of this is low-key research based on traditional resource management practices and local knowledge (Ramakrishnan 1992).

13.9 Unmanaged Forest

Once the land comes under the management of the Forest Department, then it is totally the responsibility of forest Department to take care of forest land. It becomes a forest offence for the local people to enter that area without the permission of the forest officer. The Forest department does not have connection at the local level.

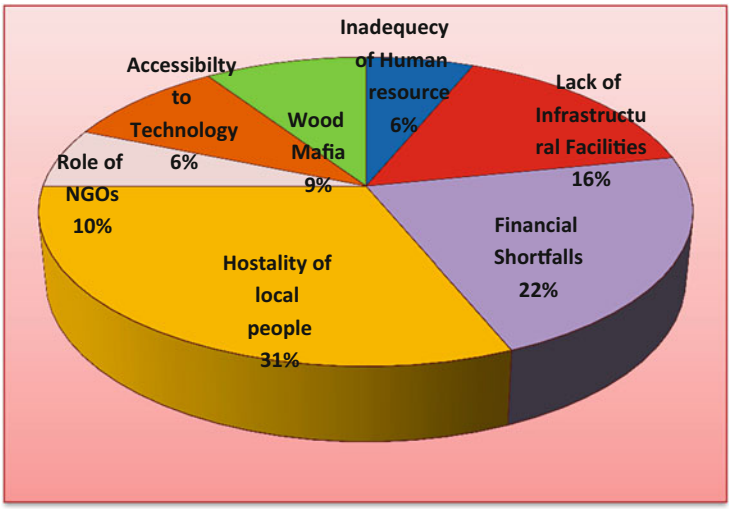

Fig. 13.3 Problems faced by forest officials

They are fully dependent on the information and help of block development officer who in turns is dependent on the village headman for the information of village problems. The visits to villages by these officers are rare making headman powerful and having monopoly over the local people in most of the cases. Over 40 % of the officials cited financial shortfall and lack of infrastructural facilities as other two major problems which they face (Fig. 13.3).

Forest officials cited many problems which they faced during the process of forest management. Hostility of villagers is the major problems at the ground level. In Uttarakhand, NGOs and civil society groups have historically played a strong advocacy role. Chipko, for example, was triggered by protests led by the NGO, Dasholi Gram Swaraj Mandal. Today, the NGO movement is split into different camps and factions. The vast majority have been co-opted to work as 'private service providers' for the several donor funded projects in the region, including the forestry project. Once they have accepted working on project terms, they effectively lose their critical and questioning voice. The overall impact is that today the NGO and civil society movements have been considerably weakened with hardly any concerted public action for protecting people's forest rights of forest data with local community demands has not progressed much in the valley.

Forest ranges administratively fall under the development block, still there is no systematic co-ordination between the development officer and forest rangers in a development block. This has created a vacuum in the administration, which has lead to increase in the smuggling activities in the valley and corruption among forest officials and headman. The study also informs us the continuous dependence of local community on surrounding forest and the need to address this issue in any forest management strategy. A project related to forest conservation and

regeneration has to be of long gestation period to deliver the results of plantations and related activities.

13.10 Analysing Forest Management

Forests are managed for multiplicity of purposes. The multi-purposes of forest management are generally protection, conservation, production, scientific research and development, and environmental. While managing a forest area block, all such purposes cannot be equally synchronised. One purpose has to take precedence over other. The multiple objectives have to be prioritized and integrated as one main objective. This aim should be dynamic changing with requirements of forestry sector as well as of the people living in rural and urban areas. As seen in the study, till today the main objective of forest management plan is – timber exploitation. With so many years of planning and management of forest, forests in the valley are degrading. The non-parametric test of chi square has been performed to analyse the responses given by the forest officials.

It was assumed that responses of forestry staff would be uniformly distributed across different response categories because all of them follow the same procedures, rules and regulations of forest management and JFM. Chi-squared goodness-of-fit tests were used to examine whether responses of forestry staff differed across the various response categories, at the 5 % significance level. The response categories chosen for factors of success and failure of Forest management were: AG: Agree, ASE: Agree to some extent; N: Neutral and DA: Disagree. The assigning importance weights to response categories has also been done in descending order of importance (AG: 4, ASE: 3, N: 2, and DA: 1). For each question, the number of respondents assigning each particular importance level were multiplied by the corresponding weights and these were summed to obtain the total score.

The responses of forestry staff about possible factors of total quality forest management for each variable are placed into four categories. The following hypotheses have been tested-

- H0: The responses of forestry staff are uniformly distributed between response categories (AG, ASE, CS and DA) for each response variable.
- H1: The responses of forestry staff are not uniformly distributed between response categories for each response variable

The analysis of forest official indicates many factors that have led to the failure of forest management in the valley. The X^2 values allow the null hypotheses to be rejected in all cases and lead to the conclusion that the distribution of the views between forestry staff is not uniformly oriented across importance categories (Table 13.4).

Based on scores, the ‘communication gap’ is considered to be the most important factor leading to failure of forest management in the valley, followed by ‘non-involvement of women’ and ‘unemployment’. These are followed by ‘inter–village

Table 13.4 Factors for failure of forest management

Factors	Responses[a]				Goodness of Fit			Scores
	AG	ASE	N	DA	X^2	df	p	
Overlopping	27	22	14	17	4.900	3	0.179	219
Overgrazing	34	21	14	11	15.700	3	0.001	249
Communication gap	56	12	5	7	87.700	3	0.000	277
Illiteracy	29	35	5	11	30.600	3	0.000	242
Non - involvement of women	39	28	6	7	39.500	3	0.000	259
Caste structure	33	10	19	18	13.700	3	0.003	218
Poverty	32	21	12	15	11.700	3	0.008	230
Landlessness	33	19	12	16	12.500	3	0.006	229
Political interference	21	27	3	29	21.000	3	0.000	200
Scarcity of grazing areas	23	29	2	26	22.500	3	0.000	211
Inter village disputes	37	25	9	9	27.800	3	0.000	250
Unemployment	37	28	9	6	33.500	3	0.000	256
Wood smuggling	28	21	15	16	5.300	3	0.151	221
Silviculture practices	17	25	4	34	24.300	3	0.000	189

Source: Analysis of goodness of fit based on primary survey
[a]*AG* agree, *ASE* agree to some extent, *N* neutral, *DA* disagree

dispute', 'over grazing' and 'illiteracy' respectively. In this context, the use of a statistical inference technique is valid. Most of the officials cited communication gaps as major factors for the failure of forest management, but their views are not uniformly distributed as X^2 value is very high. The failure can arise from difference in opinion between local people and foresters. Communication is hampered by the seemingly broad and often inconsistent nature of central agency directives (unilateral top-down approaches). Physical distance (which hampers the frequency and depth of communication) and social distance (e.g., differences in the background and experience of top hierarchy and field staff of Forest Department resulting in elitism and language barriers) also hamper communication (Sood and Gupta 2007). Women which are the backbone of hill economy are totally ignored while preparing micro plans for villages. They have more information about the resource than their male contra part. Historically, also they are the one who had started all the major movements to save the trees or environment or actively participating in save the seeds movement or anti liquor movement in the Uttarakhand so non – involvement of women is major setback for the for joint forest management. The loss or further degradation leads to dislocation of people (www.iufro.org/science/task-forces/forest-people).

The analysis of different responses on factors for total quality management of forest areas indicates many important factors yet to be taken into consideration for sustainable yield or for sustainable forest management. The X^2 values allow again on the total quality management of forest resources rejected the null hypotheses in

all cases and lead to the conclusion that the distribution of the views between forestry staff is not uniformly oriented across importance categories. Based on scores, 'community participation' is considered by foresters to be the most important factor for achieving successful implementation for total quality forest management, followed by 'forest degradation'. The forest officials do recognise that forest degradation is still taking place. These are followed by 'energy alternatives', 'harvesting of NWFPs' and 'employment opportunities' respectively. Similar cases can be seen even at the world level e.g. industrial groups like Mattel, are under pressure to use recycled papers (www.bbc.co.uk/programmes/p00knchf).

Granting rights to use forest resources scored least as most of the officials still think that it will lead to degradation of the resource. Due to this attitude of forest officials it very difficult to reduce the communication gap between locals and the department. Therefore, training and workshops are very much needed to make people aware about their rights and responsibilities as well as making forest officials to understand better the social and cultural requirements of a particular community. This consequently allow communities, local authorities and other supporting institutions to gain experience, new skills and confidence. Reducing communication gap and active involvement of local people is the solution leading to sustainable forest management in the valley (Table 13.5).

The degraded forests are required to be tackled for rehabilitation work on war footing so that the process of soil depletion can be checked and sustainable utilization of forest products can be part of regular forestry practices. The survey also indicates that local people know that there exist the problem of degradation and it need to be worked upon.

The forest officials are also aware that people do understand the problems related with forest resource. Again chi square test analysis shows that their responses are not uniformly distributed across different categories. More than 56 % of the forest officials think that local people are highly aware about forest degradation, while

Table 13.5 Factors for total quality management

Factors	Responses[a]				Goodness of fit			Scores
	AG	ASE	N	DA	X^2	df	p	
Forest degradation	45	12	10	13	41.900	3	0.000	249
Energy alternatives	38	20	14	8	25.200	3	0.000	248
Subsidies for fodder	31	19	11	19	10.200	3	0.017	222
Harvesting of NWFPs	38	19	13	10	23.700	3	0.000	245
Availability of funds	39	11	17	13	25.000	3	0.000	236
Community participation	42	21	8	9	37.500	3	0.000	256
Awareness & workshops	27	24	16	13	6.500	3	0.090	225
Frequent meeting with JFM members	36	19	13	12	18.500	3	0.000	239
Employment opportunities	34	25	11	10	20.100	3	0.000	243
Granting right for forest use	19	25	10	26	8.100	3	0.044	197

Source: Analysis of goodness of fit based on primary survey
[a]*AG* agree, *ASE* agree to some extent, *N* neutral, *DA* disagree

Table 13.6 Responses of forest officials about level of awareness among people

	Responses			Goodness of fit		
Issues	high	medium	Low	X^2	df	p
Level of degradation	45	23	12	21.175	2	0.000
Need for forest improvements	56	17	7	50.275	2	0.000

Source: Analysis of goodness of fit based on primary survey

70 % think that there is need for forest improvements. Fifteen per cent of the official responded that local people are less aware about forest degradation and more than 8 % think that local; people do not need improvement in forest conditions. This analysis indicates that there is not much gap in the understanding of the problem only thing required is to remove communication barriers so that things should become transparent both ways (Table 13.6).

The primary aim of the forest officials is to have power, authority, security, and facilities. The majority of staff considers increasing the legal authority in dealing with people to be a better option, which indicates lack of inertia for change of functioning and management style, and implies that staff is still oriented towards their bureaucratic role (Sood and Gupta 2007). Forests are owned and managed by government. Therefore, forest ownership is public in nature. Public ownership of forest enjoins upon government a responsibility to manage forest in such a way that it maximizes generation of public goods. With the introduction of New Forest Policy, a new era dawned in the forestry sector. Forest management focused on conservation of forest resources with the help of community participation as part of the Joint Forest management policy of the government. Although, there are many problems with this policy but it proved the commitment of government to give right to local people of forest resources. A right based approach to development is need of the hours The International Alliance of indigenous people even demanded rectification in the UN draft declaration on the rights of indigenous people (www.international-alliance.org/documents).

There is also a need for special efforts to attract more women into the forest departments, especially at the field level. A number of problems arise within the Forest Department because organisational changes have not kept pace with the changes in forest management objectives. Forest Department continue to be a hierarchical, centralised, top-down bureaucracies where instructions flow from top to bottom and only compliance information flows back. The entire system is control-oriented, and deviations from set norms are not allowed. There is a need to actively promote a participatory culture in the Forest Department also.

13.11 Concluding Comment

The forest policies are evolving at various stages and at various levels, but they need further strengthening and legal support. The forest policy should guide development of the forest sector and provide a clear indication of the state's

goals for community forestry. The settlement process and expropriation of forest is a significant factor contributing to the deep resentment among forest dwellers and the people who are fully dependent on these resources. The concept of JFM is a central feature of the National Policy of 1988. It has been endorsed and initiated by all the states but there have been no accompanying changes in the national legal framework to implement it. It is operational through administrative orders and circulars, although it has been linked to state legislation in Uttarakhand. Moreover many programmes, so many policies make people more confused with the whole administrative structure. Traditional community institution like van panchayat can break down in the face of economic change, and external pressure on forest. In villages in which traditional system of management is still prevalent, they are often reluctant to share the management of forest resources with the forest department. The focus should to develop a model in which communities in collaboration with panchayats assume responsibility for micro planning, implementation, harvesting and conservation for forest areas. Although JFM on many counts has been successful in fostering forest conservation but it is rigid in terms of addressing social and institutional conditions across different communities.

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