Chapter # 6

Summary, Findings, Conclusions and Suggestions

After having the overview of the area of study from ecological and environment angles, the findings have been arrived at leading to conclusions, on the basis of which an integrated strategy/frame work and Sector specific strategies / models have been suggested to evolve an integrated model of environment management for Dhauladhar foothills.

6.1 Summary & Findings

Inferences drawn from the review of environment status and policy frame work and case studies already discussed in the fourth chapter are:

- The area of study is degrading fast from environmental and ecological point of view.
- Unique locality factors like heavy rainfall, excess biotic interference by animals and human population (both sedentary and visiting), eroding and sliding soil strata, cloud bursts, flash floods, high seismicity, steep gradients, varying temperature range, micro climatic changes and receding snowlines and unusual weather conditions etc.- all are contributing towards environmental degradation.
- Use of land for development purposes and deforestation has further aggravated the situation.
- Excessive grazing is also adding to degradation.
- Wrong methods of cultivation i.e against the contours are another degradation enhancing factor.
- A major cause of degradation is increasing constructions done\ being done in an ecological incompatible manner defying town and country planning norms. Development plan-2001 prepared during-1987-88 has not been implemented in letter and spirit.
- Lack of proper drainage is causing soil defacement, erosion and slides along the rocks, nallas and paths.
- Construction of roads is also causing erosions, slides and slips. This is
evident from Ghera road, Mcleodganj road below Deputy Commissioner residence, Dharamkot Bhagsu by pass road, Tauchohra road, Prime Minister Sadak Yojna road in Khanyara and Sudedh.

- Failure of community to manage "solid waste garbage" is leading to the contamination of the soil all along the catchments and spoiling the natural environs all along the hill slopes. Garbage management center recently constructed by municipal committee has not started working properly.

- Sewerage system, though implemented, is not up to mark and covering the whole area due to obstructions in the proposed lines.

- There is no systematic regulation of tourist activity to harmonize it to the ecology and environment of the area and "negative impact of tourism is visible in the area in the shape of open defecation, polybags, garbage dumps, traffic jams, smoking of charas and drug addiction. This is also spoiling local youth and culture, thus polluting corrupting indigenous cultures which have been living in isolation in nature's lap for ages. Alien cultural contacts and marriages with foreigners in upper Dharamshala has posed new challenges to the traditional community and contaminating hill 'life styles'.

- An other feature relevant on the front of social environment is that native community- the Gaddies are living in harmony with other people who migrated to areas including the Gurkhas who have totally assimilated the local culture and traditions. But Tibetans refugee who came to this area in 1959 and afterwards are living as a different cultural entity and have not assimilated local values and society leading occasional ethnic clashes, though very rarely. Tibetan community is also taxing the carrying capacity of the area and its natural resources.

- Scars of reckless quarrying can be seen in Ghaniara and Bhagsu areas. The area between Manjhi and Mannuni is under constant threat of being washed away by flash floods. Unemployment in Ghaniara region is due to declining activity of slate mining and is a source of worry in the context of social environment. Restriction on slate quarrying from time to time and check on ecologically harmful mining.
activities like extraction of shinger, sand and stone from nalas is causing sudden joblessness among locally employed people which is a major cause of social tension and steep fall in per capita income of target area.

- Commissioning of “hydel projects” in the area of study [Gaj & Manjhi] has only led to environmental damage to area and their environment management plans have not given the desired results; however, some amenity improvement in the environment in the shape of facilities, services and conveniences has been created.

- Inspite of efforts for rapid ecological conservation\preservation like tree plantations, closures, landscaping and bio diversity enrichment, the desired augmentations and development of natural resources have not been achieved in a manner that the sustainable replenishment of natural resources is achieved and community’s social needs of fuel wood, fodder, timber, improved microclimate, scenic beauty and aestheticism are met constantly.

- Institution of ‘cooperative forest societies is still relevant and can be made use of with certain innovation as suggested in the case study.

- Participatory approaches of “joint forest management” are not giving the results due to rural conflict for sharing natural resources and lukewarm attitude of government agencies.

- Natural disasters\environmental hazards like earthquake, flashfloods, cloud-bursts, and missing of trekkers have high potential in the area and there is no “disaster mitigation plan” at the local/district/state level and it is only recently that a though is being given to this aspect.

- Tibetan refugee shifting population in the area has never been taken into consideration in government planning and schemes resulting in error of judgment and objectives and defective budgetary provisions.

- Pace of degradation is conspicuously visible from:
  a. big slips in Naddi forest especially at Talnoo and Ghera
  b. a land slide behind hotel Dhauladhar Dharamshala
  c. two big slips in Tau-chohia area-{one formed during 2004} formed due to the creation of artificial lake.
  d. artificial lake created in the upstream of Manuni during the rainy
season of 1999 caused a widespread panic of potential natural disaster in the foothills.

e. increased siltation in the trained nallas in Dal lake catchment area is a visible example of disappearance of top soil in upper Dharamshala

f. a fault line passing through Jogibara, Gamru and Khazanchi Mohalla has been a constant cause of land slips and disasters.

g. slippage of road all along nine kilometers Dharamshala-cantonment especially below Deputy Commissioner residence is strong evidence of immediate ecological degradation pointing towards impeding catastrophic disaster.

h. large-scale uprooting of trees in Banoi and Dharamkot reserves in rainy seasons especially during 2004.

i. Failures of regeneration of fir and Kharsu in upper reaches of study area.

j. Newly formed choes and gullies in Banoi reserve forest below dalai lama temple road.

k. Right holders/stake holders pressure on the study area.

l. Encroachments on govt. lands which have exceeded “250 in No.” as on record.

- Different departments/agencies have their own perception of the problem and having their own policies and strategies of rehabilitation which may at times, be at conflict with one another. An integrated approach/strategy specifying the role of each institution is non existent.

- There is no platform for conflict resolution while sharing, using and renewing the natural resources assets, sites and values.

From the preceding account, it becomes clear that the environment in the area of study is undergoing a rapid change and factors responsible for it can be categorized into two broader heads macro level and micro level:

a. **At macro level:**

   i) Global warming

   ii) Greenhouse effect
iii) Melting of glaciers and receding snowlines

These are the general changes taking place all over the world and thus also having impact on the area of study. However, it will not be out of context to quote here a report published in an English Daily, “The Tribune” dated September 9, 2005, published from Chandigarh, titled as “Study predicts adverse climate impact”. Three year Indo-UK Programme on Impacts of Climate Change in India was jointly undertaken by the Ministry of Environment and Forests, the UK Department of Environment, Food, and Rural affairs (DEFRA). Increase in the intensity of rains and temperature and more cyclones due to climate change among the adverse impact predicted for India as it will advance into the 21st century. According to this report, major impacts of climate change are indicated for agriculture sector.

b) At micro level:

i) Excessive population pressure on natural resources resulting in encroachments on government land and removal of more trees for housing needs.

ii) Faulty forest and pasture management resulting in the failure of regeneration and denudation of slopes in some areas.

iii) Failure of the authorities to regulate mining activity. Even the attempts of government to pursue the mining activity on co-operative basis and in an eco-friendly manner has not yielded yet.

iv) Increased building constructions.

v) Failure of town and country planning wing to prepare a realistic development plan for the area for providing suitable amenity environment and lack of proper mechanism for effective implementation.

vi) Non-implementation /violation of planning norms and policies.

vii) Road construction in fragile areas /swarming settlements.

viii) State of infrastructure that is, bad condition of roads non availability of well equipped hotels, parking places, by pass roads, garbage management, potable drinking water—all are proving counter productive to the sustainable livelihoods and enhancement of the place as an important international spot as observed during “Indo-Pak friendly match of Cricket” played at Dharamshala from 2 to 6
March 2005.

ix) Lack of sustainable tourism management leading to damaging impact on the environment is counterproductive to sustainable livelihoods.

x) The disaster mitigation plan is non-existent and casual meetings and planning take place when some disaster happens.

xi) No proper mechanism for monitoring, evaluation and control of the factors causing damage to the different components of the environment in the area of study. Variance in perception of different institutions, agencies regarding environmental issues and lack of an integrated approach for managing the same.

xii) Lack of awareness on environmental issues and its absence in curriculum of education.

xiii) There is no well-defined platform/mechanism to positively regulate the cultural contacts and filtering the negative impacts of modernization: old traditions are dying and addiction to narco-drugs is increasing.

xiv) “Outdated laws and faulty implementation”.

6.2 Conclusions & Suggestions

In pursuance to the fulfillment of the research objectives and findings following conclusions and suggestions have been made.

6.2.1 A Base line survey: A base line detailed survey of the core area to collect and document information on following lines to prepare the sectoral data sets for the state of environment of the study area and represent its statistically may be carried out on following lines:

- Geographical profile: Geographical location, geological structure, topographical features, drainage network, soil types, climate conditions, population and human settlements.
- Land profile: Classification of area, geographical area, decadal land use pattern shift and its analysis, critical issues in land management.
o Geology and mineral resources: Description of geology and its mineral resources, state of exploration, state and scope of mineral based industries, environmental issues relating to mining.

o Forest resources: Forest cover, forest types and composition, plantations, forest working and harvesting, historical background of forest settlement and its relevance in present scenario and need for amendment, contribution of forests to local state and national economy, decreasing bio-mass (organic material) from the forest, distribution rights for construction/repair of houses, forest based employment.

o Wild Life: State of conservation and eco-development support, Wildlife surveys and census, protected areas, projects and action plans for wildlife management.

o Agriculture: Agro-climatic conditions, soil surveys, irrigation system, changing floral and faunal communities and shift in crop pattern, scope and application of modern technologies, cash crops, organic farming and mushroom farming and cash crops (like tea), lesser known food plants of the area, soil degradation and conservation, agricultural marketing, waste lands and their management, use of pesticides and their residue in food.

o Horticulture: Scope for horticulture crops, climate and soil in relation to horticultural crops including ornamental horticulture and land scaping, scope of fruit and vegetable processing units.

o Water resources: Surface and underground water resources including traditional water resources, drinking water requirements and gap, urban water supply and sewage, environmental issues in water management, water born diseases and water quality monitoring.

o Conservation status on wet lands: Ecological status of wet lands, status, scope and constraints of reservoir and reverine fisheries.

o Grazing lands and pastures: Types of grazing lands and pastures, their shrinkage, grazing pressure and carrying capacity, improvement of grazing lands and pastures, grazing systems, socio-economic profile of grazers, hill specificities: interactions and sustainability issues.
Animal husbandry: Present status of animal husbandry; improvement programs and impacts, food demand for livestock.

Environmental legislation: Enlistment, updating of laws and policies relating to environment, scope for amendments and mechanism to review from time to time.

Industrial development: Resource potential, infrastructures, industrialization trends, major industry groups, scope for traditional and small scale industries.

Energy: Status of energy, scope of small hydro projects, non-conventional resources of energy, traditional domestic fuels and their consumption patterns and energy conservation.

Archeological and culture: Ancient remains and prehistoric sites, fair and festivals, traditional use of natural resources, architecture and building material, ancient approaches of conservation, relevance of local Gods and traditions.

Pollution: Air and water pollution and its monitoring, present state of environment problems and countermeasure like environment impact assessment studies, environment research and studies, garbage generation and solid waste management, status of water and wetlands, urinal/toilets – Sulabh Sochalayas and their status.

Biodiversity conservation: Status of faunal diversity including forest, hysobionts (inhabitants of high altitudes) and domesticated animals, threatened animal species, status of plant bio-diversity (forest, medicinal aromatic plants and agri-biodiversity) threatened plant species, factors affecting the loss of biodiversity, intellectual property rights, farmer rights and community rights and indigenous biodiversity conservation strategies.

Natural disasters: Type of natural disasters, spatial distribution of environment degradation, over-ploughing and unsystematic farming.

Tourism and environment: Yearly no. of tourist visiting the area, available tourism infrastructures, negative and positive impact of tourism.

Health and environment: Health care scenario in the area of study and indicators.
Women and environment: Status profile of women and their dependence on the environment.

Environment Education: State of environmental awareness and gaps.

6.2.2 **Enlisting of different institutions:** Enlisting of different institutions in the area of study should be done for:

- Their perceptions and concerns
- Policy objectives
- Approaches mechanism and models of implementations
- Monitoring, evaluation and corrective mechanism
- Mechanism for resolution of conflict in the process of environment management.
- Status of existing policies, legislations and need for amendment.
- State of intra and inter-sectoral communication and integration.
- Action needed in priority areas for networking with other sectors to realize the main goals of strategic environment management.
- Different projects and schemes in vogue and perceived plans for the future.
- State of research, innovations and scope and need for modification / alternation of approaches, strategies and systems of management.

6.2.3 **Creation of Municipal corporation:** Since the area adjoining the municipal limits of Dharamshala town is fast urbanizing and the total population of municipal areas and adjoining areas of Mant, Dari, Sidhbari, Naddi works out to be more than 40 thousands and this is without adding the almost equal no. of Tibetans and visiting tourists who are not accounted in the censes. This is a fit case for the creation of a municipal corporation in the area for better management of environment and other sectors. Therefore, it is recommended that the area may be converted into a Municipal Corporation.
6.2.4 Evolving an Integrated strategy:

Before suggesting/designing integrated strategy for the core area it will be relevant to evaluate the prevalent integration strategies in and around the study area and come out with list of limitations so that the same can be overcome/resolved in the proposed strategy.

Following strategies/projects have been examined in this context:

- Integrated rural development strategy: At the district level, "District Rural Development Agency" concept is providing an integrated orientation in grass-root programme under the control of Block Development Officers. It is an attempt towards "bottom up" approach of integration lacking thorough micro level planning/community participation and effectiveness to infuse the integrity principles into the prevailing policy planning framework and mechanisms of different departments/agencies at different levels and actually fails to do multifunctional policy analyses/innovations. It also leads to duplication of policies, allocation of budget and wastage of expertise and resources. Thus it lacks the holistic approach of participation, capacity building and dynamisms of effective management model.

- Forest Development Agency: This attempts towards integration departmental policies and programme in working under forest department as a nodal agency. Following deficiencies have been observed in regard to integrated environment management here. (i) There is little or low sectoral integration at the joint forest management committee level and at the state level. (ii) At the forest development agency level (District/Forest Division) the participation of different departments is still symbolic and is a loose coordination.

- Himachal Pradesh State Forest Sector reforms project (HPFSR): DFID (Department for International Development) sponsored project of natural resource management for creating livelihood options is being experimented in selected sites throughout the state of Himachal Pradesh. Here multisectoral involvement and community participation in micro planning and its implementation is being attempted. Integrity is visible from bottom to top level. Forest department is nodal agency for
this project. Out comes of this project will form the bases for proposed forest policy in Himachal Pradesh. Sustainability of such integration is under test yet. The concept of integrated management of forest / natural resources has not met with thorough basic sectoral integration. Forest sector reform project started with HP Forest department in the lead role, the emergence of conflict with other department is a natural outcome of its implementation. It is to be ensured that this review exercise do not lead to policy dilution of other sectors. Moreover, there is no integration for budgetary allocation for the "Ward Level Plans" in an integrated manner. Concerned sectors / departments are required to integrate relevant components of ward level plan with their policies and budgetary allocations. Thus complete integration in lacking except at micro planning and ward plan formulation levels.

- Isolated schemes: ATMA (Agricultural Technology Management Agency) and Horticultural Technology Mission Programme are some of the isolated projects promoting the concept of cross Sectoral approaches and policy integration. Such projects lack actual interdepartmental coordination, supervision and multifunctional project / policy analysis. So these are the alternatives in isolation and not a panacea for defaults in the policy formulation and management.

To strengthen Environmental regulatory institutions, the pace of policy and institutional integration has been desperately slow and lacks the financial resources and political will necessary to address environmental problems. Thus environmental degradation constitutes a constraint in the future economic development and efforts to eradicate poverty.

The sustainable development of the "Core area" has been the interest and concern of the inhabitants and more so, for the satellite habitations / villages / hamlets on the periphery of the core area. The focal concern of this research work, therefore, is to revive the traditional management based on sustainability of the hill society/stake holders; look for the "true" meaning of "sustainable mountain development", "conservation", "natural resource management", "contra environmental consumerism" and redefined them in the light of contemporary "Himalayan Development Policies" at the village / sub
national / global levels; and also prepare a LEAP / Holistic Management model for the area on sustainable levels.

Deputy Commissioner/Chairman of proposed Municipal Corporation under his supervision should create and administer a small fund say (Rs. Thirty Thousands per year) in the name and style of "local environmental protection and action examination fund" or Civil institution capacity building fund. The Deputy Commissioner/Chairman of proposed Municipal Corporation can help constitute / propose a multi-disciplinary civil society institution with 10 – 15 professional with active coordination with concerned universities and research wings can be the focal point of conducting periodical environmental assessments on voluntary basis, point out gaps in the execution of the plans, programmes; suggest correctives and can efficiently manage the documentation and processing of database, training and applied research, prioritization of wide range of ecologies (from traditional to transitional to modern) and building public pressure on the issues that local government and people face in the 'core area'.

There are many independent and non-profitable organizations also active in the area which can be commissioned free of charge for the job on voluntary basis for examining the job work critically in these foot hills and corroborating the official line of thinking. Infact, such independent views and opinions ensure a wide community participation at no extra expense, offering very useful timely correctives for officials and improve the information based / quality data as well. Moreover such an exercise is not difficult to conduct and once elements of analytical framework for assessing environmental management process are standardized, it can be a regular feature of administrative functioning year after year.

The committee can undertake paid assessment every five years with wide ecological prospective in view. This can be a part of learning process for all stake holders / administrators; so as to develop their simple Environmental Impact Assessment (EIA) mechanism and identification of priority issues including based on their own experience.

At the village/ ward level, idea is to preserve the hill heritage through voluntary initiatives. The concept is built on the belief that a movement of volunteers and directly mainly by volunteers – is the only way to win the green
social behaviour in our society which is fastly urbanizing and turning consumerist and contra environmental as concluded in EIA's / case studies – Chapter – 4.

The best way to initiate the movement is to form a unit of four or more adults at village / ward level, so to have a group strong enough to be able to donate full time or part time volunteers to the people forum at core committee level to strengthen the eco movement at all levels (the grass root to policy making levels). Such volunteers can undertake / execute site specific micro tasks or tasks assigned by the core committee / people forum.

Case studies have proved beyond doubt that participatory channels lack true spirit, develop faults over period of time and become ineffective and fail to build genuine ecological movement. Volunteerism has been observed to be the genuine eco conservation effort which is not hypocritical but actually suggest altruistic commitment to the need of the hour. During the field visit to Dharamkot area, it was commonly seen that desiltation of Dal Lake was ritualistic practice of the villagers from the surrounding villages of Dal, Totarani, Satobari and Naddi. After the Govt. took over the management of the lake, the practice has vanished and its revival has become increasingly difficult. Even latest mega plan of govt. to rehabilitate Dal lake is being taken as the interference in the traditional faith and rights by local gaddies of the area. This is one instance that goes to prove the change in ecological attitude of natives / migrants over years which need timely revival through volunteer eco-management. Rustic life styles in some of the villages of the core area are still untouched by the contamination of modernism and are seriously preserving a lot more fine things associated with cultural ecology. It is strange to find that they never think in terms of money while engaging in ecologically initiatives at the community level. On the same lines, the conceptual framework aims to revive some of such fine cultural traits to build life sustaining voluntary movement in the foothills of Dhauladhar. It concludes that altruistic civil initiatives (that transcend money) are necessary alternatives to
hypocritical, formal initiatives and contra environmental developmental activities. At the grass root level, the pooling of the voluntary traditional management initiatives are seen to build trust, collaborations, network and also expand skills of volunteers profitably, contributing to LEAP/Model of environment management, as also, seeking rectifications of errors of thinking which have been root concern of all troubles in planning / implementations and evaluation process.

Case studies conclude and provide a detailed account of rapid urbanization, global tourism inflow and its environmental consequences. The core area now needs strengthening of environmental regulatory institutions and their proper networking / integration at all levels. The pace of policy and institutional reforms and conflict resolution mechanism (leave aside integration) has been desperately slow and has lacked political will and budgetary allocations to address environmental issues. Any modest gains of isolated institutional efforts seem to be insignificant in the larger ecological prospective. They urgently needs synergies of collective eco management. Because, this area is bedrock of “Kangra Culture” where dynamics of urban growth and ecological loss interact forcefully presenting immediate challenge to district/ state policy makers to redefine development parameters that actually restore the life sustaining systems in the foot hills.

Environmental degradation is increasingly becoming a big constraint on future healthy growth of the core area. And the quality of the environment can’t be improved by repairing isolated damages. The remedial package, if any, must be focused on change in consumerist life style, managing it as a big commercial centre and by developing integrated approaches which can have lasting impact on the root causes of ecological decline. Part 2 of chapter 1, chapter 3 and 4 cover the driving forces of eco-decline which can be listed as:-

- Population growth and pressure on natural resources and damage to eco-system.
- Urbanization
- Cultural contacts
- Unplanned construction activities.
- Absence or non-scientific waste management
- Lack of community /stakeholders participation in decision making
- Weak institutions short sighted policies and their faulty implementations

Documentations of these drivers underlying ecological degradation is just first step. The next important one is to document those powerful drivers of change which strengthen the ecological restoration process. They are:-
- Civil society and public pressure
- Globalization and environment
- Judicial activism
- Enhanced governance and institutional networking
- Integration of local, regional and international governance system
- Building opportunities for integration.

The research work proves that the frame work of "Long term Strategic Environment Management" – "LTSM" Long Term Strategic Environment Management which incorporates “LEAP” is being proposed to policy makers / planners / administrators only after the damage has already been done but, the "collective" need to be in place to salvage whatever remains of it. So, urgencies to shift from environmental degradation to environment restoration in three areas :
- Policy integration and institutional networking
- Designed and planned development in the area
- Action agenda and environmental compliance.

6.3.4.1 Policy integration and institutional networking:
Intra and inter sectoral policy making is aimed to create and strengthen regulatory institution that can bring about socio economic- ecological planning frame work at different levels in the study area which can further be integrated with district, state and national plans and programmes. Policy integration also aims to overcome the fragmentary approach of isolated policies of an institution/ department that restricts the efforts to enhance holistic ecological
and economic growth impact on a wider perspective. Development of any area involves a range of services – economic or ecological, ethnic or theological from traditional to “transitional to modern levels”. So integration within individual department or sector can not bring about the desired results. Therefore inter-sectoral integration is the only remedy to achieve sustainable development / environmental management goals. To achieve such goals the local administration some times need to create innovative complementary / supportive / tertiary institution wherever needed.

"Proposed civil society institution/forum" in the core area is one such instance. Another example of effective institutional model of intersectoral policy integration can be the supply of irrigation cum drinking water from remote sources in the high land villages panchayat areas having traditional water rights to low lying users in the Municipal committee habitations and the peripheral areas. The institutions involved in this integrated water resource management model are: irrigation and public health department, testing laboratory of irrigation and public health, health, forest, revenue, panchayats and municipal committee, public works departments and users. The Dharamshala town itself is a remarkable example of British planning to mark land in the revenue records itself dividing the city in to institutional areas, residential areas, educational institutions, playground, cantonment areas, civil line for officials, police line, parks and bio-reserves and pastures for the flock of sheep and goats of gaddies – hill tribe. This is an excellent example of planning and efficient functioning and governance of different governmental wings located in relation to their inputs and outputs; but after the Britishers left Dharamshala, the successive district administration have not been able to show even a single instance of aesthetic / utilitarian designing so far, resulting in the present ecological mess. District administration has not been able to evolve the suitable waste management / disposal system for the fast urbanizing town. Urgent institutional coordination is required in the
departments looking after the water pipes, utility pipes, sewerage, irrigation channels, drainage channels, telecommunication cable laying, public works departments, so as to coordinate their activities, thus avoiding the constant digging up of roads and footpaths while expanding or undertaking repair work. So the basic principle of policy integration/institutional networking is that services provided by different sectors result in saving total cost and time and leading to long term benefits. Similarly integration is urgently required in all other sectors like tourism, transport etc., to check unplanned and unmanaged and uncontrolled urban growth/development and inadequate planning process which are unable to meet environmental economic and livelihood concerns of the native communities. The concept of institutional networking is fundamental while framing policy reforms at the local district, state, national and global levels. The meaning of scope of policy integration is a fundamental prerequisite to ensure environmentally sustainable development model.

Shift from environmental degradation to environmental restoration can be depicted in a better way by the following paradigm:

1. **Intra and inter sectoral policy integration:**
   a) This will create institutional arrangements that allow environment management and policy reforms.
   b) Development is to be designed and integrated according to environmental and economic plans

2. **Economic interest based integration**

   Global tourism economy of the area needs a transformed eco-friendly business and strategies and trade policy integration.

3. **Integration for good governance at different levels including abiding political will.**

   This will for creating enabling conditions and capacity buildings for environmental management institution including voluntary/civil initiatives
4. Designing a local framework for policy integration at the local level for the core area.

5. Action orientation of integration phenomenon
   This require prioritization of actions that need to be taken.

6.3.4.2 Action agenda and environmental compliance

Under the LTESM three broad areas for actual translation of concept into actions and effective implementation are:

- Economic action management
- Institutional action management
- Governance Action Management

**Economic action management**

1. **Adding values to ‘core area ecosystems’ by combining economic and environmental goals:**

It is the “wilderness” of core area that is sustaining the hill community – both native and aliens. And again it is the same wilderness that attracts tourists to this part. Therefore, ‘development’ in the core area should mean enrichment of “the wild” in the wilderness. High mountain lakes, snow capped Dhauladhar peaks, the meadows, the pastures, the rolling greens, the fauna, the flora and the simplicity of culture are of immense aesthetic value and commercial value; which need preservation and enrichment in the face of inevitable urban modern civilization march. So, the challenge before environmental managers is the designing “LTSEM” (long term strategic environment management) in a manner that compels policy makers and implementing agencies to identify clear performance goals, be consistent in action agenda, and make environmental priorities integral to core economic planning.

Departmental budgetary allocation should have actually environmental performance as the basis for such fund allocation. Introducing “Environmental Certification Scheme,” the state / local administration must create enabling conditions (and rewards like tax breaks, rescheduling of loans) for compliant hotel industry, builder’s lobby, traders and businessman; and withdrawal of
such incentives, deterrent penalties for those who do not comply with eco-
norms. "The civil society institution/forum as the EIA monitoring agency shall 
conduct environmental audit/green accounting (as is being done in twelve 
regions in China) to ensure that the core area eco-systems are managed and 
maintained to retain and add to their aesthetic values.

II. Documentation of bio-diversity and resource pricing –

For revenue earning from tiny herbs to towering conifers, hill cultures 
preserves the whole vegetations and the native tribe of Gaddies- a pastoral 
people pick herbs only on auspicious dates. One has to walk miles in 
Himalayan mists to observe the poverty in the scattered hamlets like Bahl, 
Barnet, Satobari .... and the richness of the floral/faunal diversity along the 
green range. Waves of flowering sweep this nature reserve of the core area 
after the snow melts. During monsoons, everywhere something grows or 
flowers.

Authentic documentation of the species in the core area has not been 
conducted by the H.P. Krishi Vishaw Vidyalaya Palampur or any other 
agency so far. Therefore identification of the species and the assessment of 
the loss of heritage over the years has been a problem. More than a dozen 
species of medicinal plants can be easily identified below the summer snow 
line of this range (within the geo-climatic zones of 3000 mtrs). The tribal 
practice of alternating their flocks of sheep between high and low pasture is 
disappearing gradually as migratory habits among the Gaddies are giving way 
to sedentarism. In recent years "bio-piracy" in the core area and across the 
ranges has been seen to flourish openly commercializing the medicinal plants 
like Violata serpens (banasfse) Hydrocotyle species (brahmi), Podophyllum 
species, Acontium species (Patish), Jurinea macrocephala (Dhoop), Ocimum 
(Tulsi), Saussersia Species (Kuth), Valeriana, Berberis (Kasmal) etc.

The cost of herbal preparation has been maintained an increasing 
trend over the year but, the raw produce of these foothills continues to be dirt 
cheap – Rs. 2 to 20 per kg. So it is clear case of robbing the native herbs 
pickers of the expertise acquired by them through generations.
The modern tools of patents, IPRs (Intellectual Property Rights), monopolies and royalty has no meaning in these foothills. Urgent action is required at every concerned level to:

- Document the bio-diversity in the area and price was produce for local/global marketing and price all natural resources in the core area using market based instruments for environmental protection.
- Maintain records and apply for patents in the name of the village hill communities; taking these medicinal herbs as traditional healing system of the native society.
- Proper EIA should be conducted immediately to make comparative analyses as to how many species have been disappearing over the years.
- Urgent measures should be taken to regenerate the grasslands/pastures.
- The networks of co-operative societies should be constituted immediately to pick/trade the medicinal plants, store, process and market these with value additions under sector specific studies.
- Pricing of tourism products in the core area the next revenue earning option. Pricing mechanism of mountain lakes/parks/sanctuaries/reserves/museums/cultural heritage has been elaborated under sector specific programmes.
- The practice to protect non-timber forest produce (NTFP) from over extraction should focus on marketing reserves for regeneration of plants diversity/pasture/grasslands and put warnings sign boards to create public awareness about serious conservation needs.
- Microplans prepared by wards (of panchayats and Municipal Committee) should be incorporated in the district and state planning and budgetary allocations be fixed accordingly.
II: Promote eco-friendly drivers of change and check contra-environmental forces.

Due to hydro electric projects and big industrial setups in some areas, dozens of villages have been evacuated to accommodate project plans. Therefore hill habitations have seen the new phenomena of environmental "refugeeism" (the term refers to the village of who are the evacuees due to big projects in the hills).

The core area is experiencing a different problem of labour retrenchment due to closer of slate mines in Khaniara. The solution lies to switching over to scientific mining in the selective areas and shifting to afforestation / conservation on the degraded slopes. This kind of experiment can bring about change in the psyche of dependent laborer without affecting ecology and their livelihoods. Similar eco-measures can be attempted by enlightening the builder's lobby/hotel industry. "Civil society institution can take up the task providing professional consultancy free of charge wherever required.

Compensatory afforestation are being raised by the hydro electrical authorities in the affected catchments areas. Strict action to be initiated to restore the ecology of the catchments area – especially in the Gaj, Manjhi and Manuni projects catchments as recommended in the case study.

Institutional Reform Action Management –

The Deputy Commissioner /Chair person of Municipal Corporation should propose a district level coordination committee of all connected institutions taking up the provisions of environmental concern in their individual departmental policy. There can be two ways of taking up of ecological issues in the area from village local bodies to departmental level or vice-versa. Now that the exercise of documentation and management of natural resources has already started at ward (grass root level as micro plans) the participation of community in the inter institutional level meetings at the district level can be easily ensured. The issues regarding natural resource management and sustainable development can be discussed in such interactive sessions called by the Deputy Commissioner/Chair person of
Municipal Corporation where all stake holders can freely meet, debate strategic issues with officials, consider optimal solutions and create / formal / non-formal groups / institutions to overseeing / monitoring the implementation of decisions at the district level. The communities can emphasize the ownership issues at the grass root levels on the basis of the concept of common heritage. The finest example of this bottom to top integration is available in the suggested “community level institutional structures" described in chapter 1 part 2 Other examples of such participation are can be:

- Lake Managements –
- Closures like ones at Chilgari and Charan Crematorium
- Revival of water bodies

For awareness existing eco-conservation model for resource generation/ replenishment, checking resource depletion, managing resources with required innovations.

The model for documenting the natural resources and water shed for generating primary database for the micro plan is given as:

- Standardization of environmental parameters and ensuring compliance:- It corroborates the state, national, global concerns with the local ones. The concerns incorporated in the departmental policies are required to standardize realistic performance parameters, which should be enforceable indiscriminately and ruthlessly.
- Ensuring involvement and capacity building of new / old institutional framework: There should be environmental auditing/ green accounting and imposing penalties for violations by hotel industries and encroachments.
- Encouragement of voluntary initiative to build eco-movement and their recognition and address their problem at the global levels.
Governance Action Management -

- **Good governance needs a backing of political will** –
  - "The bedrock of good governance, environmental or otherwise is capable, credible, fare, accountable and efficient government/administration". But there are barriers of indifference active resistance by beneficiary parties for private games and manipulative tendencies to bypass rules in the decision making process at all levels. Therefore, strong political will is needed to break such barriers and give weightage to community participation mechanism along the whole chain of policy framing exercise (micro planning) to implementation stage. Examples to governance in the core area are -
  - Approval of building maps/estimates of construction by the town planner/municipal committee/Deputy Commissioner is generally reflects the biased approach and twisting of rules to favour/disfavour the parties. The approving authorities have such tendencies only because political will is weak to enforce the rules.
  - Removal of unauthorized constructions/occupation of Govt. land is carried out/ignored on political lines.

- **Creation of Enabling condition for "Civil Society Institution"** – The creation of civil society institution of enlightened professionals from different streams as a monitoring, evaluation and assessing agency should be allowed to act as a "watch dog" on governance at different levels. The District Administration assuming new role as conveners/enablers should interact, provide access to information regularly with "Civil Society Institution" to achieve environmental objectives in the 'core area'. Such a participatory developmental exercise can go a long way in strengthening Institutions of democratic governance at governmental and non-governmental levels.

- **Free access to "information and transparency" in functioning**:
  The District Administration should update and make available every information on environmental degradation and results of
“Environment Impact Assessments” to the local public and Civil Society Institution/forum. The list of violator should be publicized. Action examination, if any, at the local / district level can be a powerful tool for rectifying policy implementation. It is to be ensured that all information gaps from village level to district level are bridged timely and efficiently so as to stimulate civil initiatives at appropriate levels. Civil Society Institution/forum has to take the “Lead” role in sustaining such ecological movements right up to State and National level.

• Synergies and Partnerships : In the developing of global partnerships on environment issues, the phenomenon should have a “Trickle down effect” to the regional and local level, too. The complexity of the environmental issues needs stake holders partnerships for designing successful policy framework. Some of these partnerships have directly been initiated at the intradepartmental level in the sectors like forest, banking, health, education and rural development. They need conducive atmosphere for strengthening their capacities to raise formal / informal institutional framework in achieving environmental objectives successfully and generating sustainable livelihoods, too. Non governmental organizations at their own level, have been carrying out strong campaigns to raise sustainable developmental issues from time to time. Government programmes need reprioritization and little reorientation to be in tune with non-governmental organization’s genuine civil initiatives. It will come up as a classical case of synergies in governmental and non-governmental initiatives, research and policy planning, monitoring and evaluation & community participation.

6.3.5 Sectoral recommendations :

In the preceding paragraphs general agenda and action management for the whole study area has been recommended but natural resources-forest, wildlife, land use for agriculture, horticulture and water;
tourism; urbanization/planning/amenity values & environment are the seven areas which need special attention. Hence separate recommendations have been made here.

6.3.5.1 Forest:

The forest land is in predominance in the area of study. Thus forests are vital components in the management of natural resources and biodiversity conservation. Here following points need consideration.

- Avenue plantations of ornamental species should be carried out and maintained along road & path sides for aesthetic and beautification purposes.
- Nature aware and amusement park (like one nature aware park at Jawali) near Pong Dam Lake may be developed at suitable points in the study area and existing ones should be developed from aesthetic, awareness and demonstration angles.
- Agro-forestry should be encouraged in the rural belt of study area to ease out pressure of community rights on the forests.
- Banoi-Reserve the heritage forest of the study area need continuous preservation efforts by way of more angle iron fencing, soil conservation proper drainage, weed control and garbage management. Some already made efforts in this and other adjoining protected forests of Dharamshala, Dharamkot, Civil forest-have shown very good results improving the quality and quality of the biodiversity of the area. All these adjoining forests to Dharamshala town need similar treatment and periodic maintenance. So such efforts must be replicated.
- All culturable blanks of forestland must be planted. Choice of species for planting should be made according to the locality factors i.e. soil types, aspect, temperature, rainfall, elevation, biotic interference susceptibilities, and silvicultural requirements and monoculture particularly of Chir pine should be avoided.
- Proper maintenance and cultural operations required silviculturally must be carried out regularly.
In higher reaches of study area especially Chakban forest the regeneration of Kharsu and other existing species is not coming up. Special efforts be made to regenerate this area with the existing species.

Suitable efforts to manage high reaches pasture lands by alternate grazing, closure, planting and sowing of suitable grass species are urgently required to arrest the further trend of degradation as this vital part of study area hill eco-system is source of perennial water.

Suitable aromatic species must be identified for planting in different agro-climatic zones and such demonstration plots should be developed for awareness, participation and adoption by public.

Thorough survey of forest land to check the boundaries, fixing/repairing of boundary-pillars and removal of encroachments at any cost must be ensured.

Awareness campaign and preventing measures against the occurrence of forest fire hazard in advance and preparedness to fight its incidence need special attention. Latest techniques of fire fighting and people involvement and participation can be more useful.

To keep the forest officials/environment managers abreast of the latest advances in field of forestry and environment and participatory cum integrated approaches of management (as relevant in the area of study), periodic workshops, trainings/retraining, demonstrations and refresher courses may be conducted.

It is not advisable to sacrifice silviculture and scientific management of natural resources to timber and other customary rights of the community. Valuation of tangible and non-tangible benefits of forest in the shape of green accounting must be carried out and any loss must be recovered from the drivers of degradation.

Working plans of forest department must prescribe a scheme for afforestation, and enrichment of biodiversity for twenty five years and periodic monitoring and evaluation to take up 'follow-up' actions to amend the plan which will form the 'vision document' to select and apply the suitable models/strategies of management.
6.3.5.2 Wildlife conservation:

Wildlife constitutes the whole flora and fauna in wild. All recommendations suggested in forest are relevant here. However, following additional considerations can be taken care of:

- The forest areas adjoining to the town and higher snowy, pasture reaches of study area may be declared as 'protected areas' for conservation. This can be done by taking the stakeholders in confidence by carrying out the SWOT (strength, weaknesses opportunities and threats) analysis. Community can be convinced to sacrifice present rights in bargain to the future benefits, which will accrue in terms of development of tourism, livelihood, aestheticism, birds and animals watching, cross-cultural enrichments and sustainabilities of natural resources. More attempts are needed to document these and unknown so far floral and faunal diversity of the area.

- To generate financial resources for the sustenance of such proposed areas and ensure stakeholders (sectoral and community) participation, conservation and management plans can be prepared and implemented.

- Biodiversity parks/botanical gardens/research centers/demonstration plots can be created at suitable points.

- Rustic wisdom, rural psyche and traditional approaches of conservation are still relevant in the rural pockets of the study area which must be encouraged and reinforced.

6.3.5.3 Land use:

The trend of non agricultural use of agriculture land especially for building construction is fastly eating into the most fertile lands of Barol, Dari and Sidhwari this trend must be restricted. Agriculture sectors needs encouragement by the way of:

- Identification ,testing and surveying of soil types.
6.3.5.4. Horticulture:

In the different agro-climatic zones of the study area, no conspicuous horticultural practices are visible. To pursue horticulture here, following action agenda is suggested:

- To diagnose why horticulture activity is not common here. What are the potential horticultural crops that can be raised here and what are the constraints to such activity and how can they be overcome.
- To prepare a scheme of horticulture development in the area with the help of horticulture and allied departments, universities, research centers and entrepreneurs.
- To provide incentives for such initiatives and support subsidies on the pattern of subsidy being to the Apple growers in the upper Himachal Pradesh.

6.3.5.5. Water:

In this important segment of environment following recommendations are made.

- Revival of Kuhal Irrigation System.
- Completion of plants based on geo-hydrological mapping, repair & maintenance of hydrants, completion of digging/installation work of deep water pumps as per mapping.
• checking of littering of lakes and catchments by the trekkers, mountain climbers, grazers.
• Revival of traditional water bodies; boulies, wells and water streams.
• Check on mining of sand, shinger and stones from rivulets and nallas.
• Regeneration /reforestation /compensatory afforestation in the catchments areas of mini /minor hydel projects for eco conservation to check the siltation in the low land areas.
• Conservation, development and management plan based on documentation of basic dynamics of the basic lake eco-system with the assistance of professional ecologists, university researchers, publics and administration. Administration to ensure required budgetary allocation for surveys, implementation and monitoring stages.
• At least two metrological laboratories are needed to collect rainfall/temperature data for high lands and low lands in the core area.
• Application of eco conservation “Duda Toli model” and resource generation model of Duda Toli, Garhwal Uttrakhand—a case study conducted by Shri Pawan Purohit for adaptability in HP and reports sent to ministry of rural development. This study was sponsored by CAPART for ministry of Rural development

6.3.5.6 Tourism:

To exist tourism development and environment in a mutually beneficial manner:

• Tourism development has to be planned.
• Sustainable tourism management tools needs to be incorporated in the planning process.
• Certain environmental indicators and standards have to be developed to gauge the environment impacts of tourism development.
• Finally depending upon the environmental; indicators environmental policy has to be formulated preferably with the instruments that are flexible and respond automatically to changes in environmental indicators and strive to maintain the prescribed standards.
In the present state of affairs for the study area farm or village tourism can be most successful sustainable tourism form as proved in the “peripheral uplands of Europe” where the income of farmers increased from 5-15% by inter-sectoral linkages. “French Gites Rurean” proved boon to marginal farmers animating rural zones both economically and ecologically. Tourism worked as an agent for eco-development in upland management in “England Lake District” bearing an image of cross country walking. This view is further endorsed by Alpine experience and Himalayan scene of Nepal, Bhutan and India. The relevance of this type of symbiotic village tourism has further been demonstrated by the tourism activity in Kanda, Bagheshwar, Uttranchal, India where local people, environment and visitors have “symbiotic relationship”.

Here visitors stay to:

- have stunning view of Himalayan peaks, birds spotting and animal watching.
- Visit ancient temples of Kanda’s heritage, regional fairs and festivals.
- Study, cultural and architectural heritage.
- Visit tea gardens.
- Undergo meditation, study natural environment.
- Have an opportunity for education on local issues / subjects, experience and learn about the field work.
- Pursue outdoor activities like trekking, mountaineering and seeing Himalayan peaks in the distance.

Hence keeping in view the data, information, experiences a dynamic symbiotic tourism is recommended for the area of study which is quite general and universal in nature and could be replicated elsewhere with or without little modifications.

6.3.5.7. Urbanization / Planning / Amenity values & Environment quality:

The area should be declared as a heritage town and following action
points may be taken care of:

- Planning is to be developed as an integrated concept and its shortcomings like undue objections on approval of maps need to be removed.

- All objections must be pointed in one go and not in piecemeal. Sufficient skilled manpower must be at the disposal of town planning wing. Master plan should include city beautification plan.

- Tibetan refuse and encroachment on public land is a very serious issue which should be dealt strictly.

- Carrying capacity of each area must be assessed so that the resources are not taxed further and degradation is stopped altogether.

- Each sector to have its own plan. It has been observed that while framing master plan information sharing between the departments/institutions-public or non governmental and stake holders are almost non existent. Therefore projected targets generally go erratic and contradictory.

- Waste management: As the waste generation is more than one thousand qtls. per day in the area of study, before taking it to treatment site, it must be segregated into bio-degradable and non bio-degradable at the generation level, which is not done presently. Segregation plant at the site needs to be in working order as early as possible. Disposal sites may be marked keeping in view the garbage generation for next twenty years. The manure / organic material produced by treatment plant can be sold to forest/agriculture nurseries and that can bring handsome earning to the municipal committee. Better to have more professional consultancy in this field.

- More public toilets are needed in the municipal limits at suitable places. Cleanliness must be maintained, so that there is no foul smell in such areas.

- More parking places at suitable points.

- To decongest the busy areas traffic can be diverted via designed/planned bypasses.

- For recreational and aesthetic purposes more play grounds and
community gardens should be developed at proper places.

- Seismic designing of structures should be mandatory while approving the plans without exception.
- Demolish all unauthorized/extension on to the public roads /paths /streets so as to build / maintained proper drain.
- Street lighting provision should be made through out.
- Revision of taxation for urban amenities to generate more revenue for municipal committee /local bodies. Arrears if any, must be collected forcibly to check revenue leakage.
- Communities /institutions can be motivated to generate resources for construction of tree guards for roadside plantation work and parks maintenance.
- At suitable places, walking trails can be developed and maintained for public use.
- A local pool of at least five buses is enough to carry the daily commuters /office goers /house wives /school children in the peripheral areas of Chilgari, Bhagsu, Ramnagar / Shamnagar etc.
- Clubs, gymnasium, library, press clubs, sports clubs facilities, recreation parks, community interaction centers for fairs, festivals and cultural activities and boating facilities at Dal Lake, lift facility, ropeways trolleys from Dahramkot to Triund, Mcleod Ganj to Bantu (Tau Chohla) are to be created at relevant places and maintained by local bodies\ administration by charging reasonable fees.
- Nights inns/dharamshalas should be properly refurbished to meet the need of low budget visitors\ pilgrims and unemployed interviewees
- Proper vegetable market should be developed to meet the urban demand.
- Tourist information centre should be at the entry point of the town.
- Repair\ construction of rain shelters at suitable places.
- Raising social forestry plantations in and around the crematoria grounds and construction of low wood consuming crematoria.
- Desilting/ cleaning of city lakes and waterfalls should be regular feature of the city. Community participation in such programs must be ensured.
• Choice of ornamental and climate specific species of flower plants should be made for plantation along public road sides/public compounds.

• To ensure proper chlorination of water sources/traditional water sources, the water testing laboratory needs to be strengthened and there should be mandatory rain water harvesting provisions with old and new houses.

• Irrigation and Public Health Department. should ensure that there is least wastage of supplied water in transit.

• Proper sign boards of ecological awareness at suitable places should be displayed with the approval of district administration/local self government. with “stick no poster/pamphlets”. District administration/local self government. to enlist the cooperation of educational institutions, political parties, offices/students and employees unions to maintain the neat and clean image of the town.

• Littering on hill slopes should be penalized strictly. Open defecation in nallas, drains, and rivulets should exorbitantly fined and proper public latrines be constructed wherever needed for the labor class.

• Segregation of biodegradable and non biodegradable garbage for proper disposal.

• Any plan for the establishment of polluting industry should be struck down strictly to maintain the environment quality of these foothills.

• To check forest fire during peak summers, attempts should be made to convert pure pine forest to mixed ones

• Highlands of study area ranging from Khaniara to Triund to Tahwa and Banoi reserve forest [1800 meters and above] should also be declared as protected area/sanctuary. This step on the part of the forest department shall ensure enrichment of biodiversity including native plants and wildlife in the foothills and refixation of healthy microclimates/snowing and revival/improvement of alpine/sub-alpine meadows and endangered species.

• Drug de-addiction centres are to be strengthened and awareness campaigns against drug abuse/drug mafia in the area to be
undertaken by the district administration.

- Illegal over stay /entry of foreigners and Tibetan refugees should be monitored strictly to ensure compliance of rules, regulations of law of the land. It is the need of the hour to check quick eco-cultural decline in the foothills.

- The hotel lobby specially in Mcleodganj, Dharamkot, Bhagsunag and Naddi areas is opening/damaging the hill slopes and disturbing beautiful deodar forests. They have their pressure lobbies to bypass the law and avoid penalties through political and other connections. Heavy charges should be fixed for such violations indiscriminately. “Polluter pays” principle should be enforced on Tibetan refugee settlements alongside the ancient forests.

- Construction of new roads through nature reserves should be banned immediately as newly constructed roads in Dharamkot, Khaniara has done a lot of damage to the ecology and environment. Deodar trees take years to restore the “wildness” of the area.

- Documentation of species both fauna and flora should be conducted in consultation with Bombay natural history society and wildlife institute, Dehradun, the scope of introduction of exotic/native medicinal species can be explored.

- A biodiversity museum, if created, shall go a long way in enriching the local flora and fauna.

- Periodic environmental impact assessments in foothills and departmental monitoring and evaluation should be conducted regularly to update the environment management plans. Green auditing for sustainable development and lifestyles must be taken up.

6.3.6 Sectoral Management Models:

Though the Integrated Model of Environment Management Developed in this Chapter is universally applicable, yet Natural Resources including Land and Water and Tourism – are most important areas which must have separate sectoral models.
6.3.6.1. Land:

For land management for different purposes including agriculture and horticulture, GIS model as described in Chapter II can be applied with local modifications.

6.3.6.2. Water:

For water conservation following schemes is recommended:

- On sloppy areas trenches in staggered manner, can be dug as tried in Dudha-Toli area of Uttranchal. Thus the size of the trenches can be decided keeping in view the gradient, soil type and rainfall. Normally this size should be 1-2 mtr long, 50 cm -1 m wide and 20 – 50 cm deep.

- There should be compulsory rain water harvesting provisions in the new and existing houses at least in the planning area of the town.

- Proper training of nalas in different catchments / watersheds will also lead to water harvesting along with silt detention.

- Improvement of traditional sources of water.

- Use of identified ground water resources.

6.3.6.3. Natural Resources:

For the management of natural resources steps to be carried out are: Participation, information, NGO’s involvement, extension, communication, micro planning and monitoring. PRA and RRA techniques can be used as per requirements. Participatory Natural Resource Management-a book written by S.S Negi can be used as a reference book for specific management of natural resources—soil, forest, grasslands, water and livestock of the study area.
6.3.6.4 Tourism

Against the background concluded in the case study relating to the tourism aspect of the study area, a suitable model for sustainable tourism has been developed as under:

![Diagram showing the model for sustainable tourism]

The above model can be represented in a more simplified manner as follows:
6.3.7 **Integrated Model of Environment Management**:

Before developing an integrated suitable dynamic and replicable model of environment management, management functions which need performance should be reiterated. Basically management means getting the things done i.e. realization of set goals. This means planning and implementing the decided activities and getting the results. Different management thinkers mention different management functions.

Our goal is to ensure integration in all management functions of individual sectors / institutions and in the networking of institutions.

From the integrated strategy and certain important sector specific recommendation models of environment management, finally, here an attempt has been made to evolve an integrated strategic, dynamic and replicable model of environment management. All available such models including sustainable livelihood framework “7 “s” model” of DFID have been reviewed. For environment management, before sectors are integrated, and institutions and networked each sector / institution needs strengthening. For that following paradigm has been suggested:
In this paradigm first of all, vision and broad goals of the individual sectors / institution are to be translated into set objectives. For the realization of these objectives functions and activities should be defined with the required management framework. For smooth achievement of objectives, organizational design and development must be reviewed and amended from time to time. Structure, Systems, Resources need and development and Organizational Development are the areas, which demands attention here. For structure i.e. role and status of the players in the institutions, operationally and support needed should be taken care of. System refers to management functions, information, education and communication; research and
development; reinforcement for sustainable livelihoods and sustainable environment management. Resources need and development point to the existing and required human and physical resources. Organizational redevelopment pinpoints the required changed in attitudes, images, motivation and management styles so that the set objectives are achieved.

After strengthening the capacity building of the individual sectors, how the planned human impact on environment is perceived by individual sector and the direction in which the process of environment management can be carried out is depicted in the following diagram.

**Planed Human Impact on Environment**

- Planning activity and Setting out an objective
- Information, Education and Communication
  - Sectoral Perception about their role, environmental impact, methods of implementation and resultant benefits
  - Logic of consequence
    - Decision making
      - Logic of appropriateness
      - Implementation
        - Sorting, sequencing models/strategies of relevant institutions / sectors for application in the process of integration
        - Conflict Resolution
        - Monitoring the integrated process
        - Evaluation with respect to set objectives (by independent agency)
        - Feedback

Fig 6.4

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In a quest to achieve the goal of environment management individual sectors perceive the human impact on environment, need for the management, their role and methods in the process of environment management and resultant benefits through information, education and communication (IEC). Accordingly these individually sectors decide applying "logic of consequence and logic of appropriateness" as described in Chapter 1 and play their role in the implementation, resolving the incoming conflicts as suggested in chapter on conflict resolution. Process is to be monitored, outcomes evaluated and feedback inducted in the planning process.

Still, there is a need of holism, synergies and thematic appreciation in environment management. For that, following model is developed.

Fig. 6.5
In this arrangement coordination, collaboration, and participation of sectors/institutions / agencies for integration in information, communication, decision making, management plan preparation, its implementation, monitoring and evaluation, feedback and innovation is suggested. Point wise description of these steps is as under:

1. Environment
   - Physical
   - Socio-cultural
   - Built
   - Amenity Environment

2. Themes
   - Development, sustainability, adaptability and livelihoods
   - Diversity: of cultures, ecologies, technologies and resources
   - Concept of intergenerational equity and precautionary approach.
   - Interactions and interdependencies.
   - Search for alternatives.
   - Holism/synergies.

3. SWOT (Strengths, Weaknesses, Opportunities and Threats) analysis is needed in terms of the proposed action vis-à-vis improvement / sustainability of environment. Micro-planning is a grass root participative realistic planning to diagnose the present status of the under taken environmental problem and explore compatible solution.

4. Strategic Environment Management Plans is a proposed action plan based on SWOT analysis and micro-panning.

5. Management functions to attend the problem has been described in the commencement of this section.

6. Allocation and sequencing of the role of the concerned / related institutions, agencies, sectors be fitting their policies, laws and plans.

7. Sectoral Methodologies / technologies / system of management / EIAs in pure or collaborated or integrated form (as the case may be).

8. Identification of potential conflicts at various stages of planning and implementations and applying suitable conflict resolution mechanisms as elaborated in the conflict resolution Chapter.

9. Monitoring the process of planning and implementation vis-à-vis set goals.
10. Exploring innovations from outcomes for application in the changed scenario for strategic environment management.

This model of environment management appears quite dynamic, strategic and replicable. But still more focus is needed on information from sectors and collective information as designed data sets and decision making which is involved at every step. Further there should be suitable mechanisms for assessing / testing the levels of integration at sectoral and collaborated levels. To attend/fulfill these requirements following models are developed.

- Designed data sets

- Decision making

Coordination Team
- Policy makers
- Researchers experts etc.
- Stakeholders (Public/ NGOs/Pvt. /Civil society)

Process

Tools
- Environment assessment / modeling (Risk / ecological environment assessment and simulation models).
- Decision analysis (Group decision making techniques / decision methodologies and software imperatives in decision making).

Fig. 6.6
Twin track work sheet for assessing the integration sector wise and collectively at the conceptual and actual levels is developed as under.

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<thead>
<tr>
<th>Parameters</th>
<th>Imperatives of Sectoral integration</th>
<th>Imperatives of conceptual integrity</th>
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<th>Imperatives of scope for new initiatives / innovations / alternatives</th>
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<td>Consistency</td>
<td>Outcomes</td>
<td>IEC</td>
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Table 6.1
In this twin track work sheet values in terms of Yes / No or Percentage can be assigned to imperatives to assess / test parameter wise the levels of integration and decide the future alternatives / initiatives.

Finally in the light of the preceding background, a perfect integrated dynamic strategic and replicable model for environment management of study area is evolved and standardized as follows:
This model is self-explanatory.
Considerations / Parameters for applying the model in the area of study:

Now applying this model in the area of study, some considerations/parameters are required to be decided. These parameters / criteria may vary from situation to situation while replicating this model elsewhere. Here following criteria are suggested:

- On the basis of elevation and agro climatic zones – Whole study area can be divided into -
  - Temperate zone
  - Transition zone
  - Tropical and Sub tropical lower plains

“Agro climatically” zonation is as under:-

- Sub -mountainous low hills and valleys (Chilgari, Lower Dharamshala, Barol, Sidhbari and Gharoh)
  - Sub humid mid hills zone (Kotwali, Gamroo, Tau, upper Sudhed, Mcleodganj and Dharamkot)
  - High hills (Triund, Illaqua, and high reaches of Chakwab and Ghaniyara and high land pastures)

- On the basis of urbanization :-
  - Mcleodganj, Dharamshala (Municipality area)
  - Adjoining suburbs (Mant, Jawahar Naga, Dari & Sidhbari)
  - Rural out skirts (Remaining areas)
• On the basis of information education and communication:-
  ▪ Most aware, literate and connected with infrastructure (Municipality area)
  ▪ Most aware, literate but with partial infrastructures (Suburbs)
  ▪ Little aware and with little or no infrastructure (Rural pockets)

• On the basis of tourism:
  ▪ Highly tourist frequented areas – Mcleodganj, Bhagsu, Dharamkot and rest of Municipality area.
  ▪ Moderately tourist frequented areas – Rural Naddi, Sidhbari & Khaniyara
  ▪ With little or no tourist – rest of the study area.

• With respect to town planning :-
  ▪ Areas within town planning limits.
  ▪ Areas outside the town planning limits.

• Areas with reference to “tribal settlements” :-
  ▪ Tribal dominated belt / areas
  ▪ Tribal Minority belt / areas.

• Classification of area with respect to natural resources (NR) especially forests:-
  ▪ NR rich areas with urban impact – Municipality areas.
  ▪ NR rich areas with rural impact – Gharoh, Sudhed, Khaniyara & Sidhbari
  ▪ NR scarce areas – Rest of the study area.
• Categorization with respect to seismicity: - whole area falls under zone V. Locally within zone V study area can be categorized as:
  - Most sensitive – Naddi, Dal, Cantonment, Kotwali Bazar, Gamroo, and Childari.
  - Very sensitive – Bhagsu, Dharamkot, Tau & Choula and Khaniyara.
  - Moderately sensitive – Rest of the study area.

• Diagnosis of area from soil degradation and susceptibility angle:
  - All nalas and their banks
  - All steep sloppy areas of Khaniyara, Tau Chohla, Naddi, Satobari, Jogiwara, Gamroo and Chakban Banoi and Dharamshala forests.
  - All roads and paths sides.
  - Rest of the study area.

• With reference to problem matrix / issues: In Chapter - 3 “12 problematic areas” for environment management have been diagnosed. SWOT analysis for prioritization of each area should be done for micro planning, so that optimal solutions are attempted.

  To sum up, the key elements of research work are: Interdisciplinary approach, designed data sets, adaptive technology, and strategic integration, modeling framework and its replicability and rectifications of error of thinking. And, at the foundation of the research is “Integrated Model of Environment Management” spanning a wide range of linkages among stake holders, sectors and disciplines and focusing on essential research in local resource use and ecosystem preservation. As a regulatory mechanism/ action examiner, the model emphasizes a “Local Area Plan” under the supervision of “Civil Initiative Forum”. As a dynamic frame work, the
model will receive new inputs, provide feedback and offer alternatives. Also, a remedial package, it will be the basis for the kind of analytical work and decision making which is required to capture a clear picture of current ecological crises and challenging ahead.

It is believed that this research will be of immense utility to the environment managers, planners, administrators and researchers. It will also help the communities as a sustainable survival strategy.