PROJECT : PROTECTED AREA (P.A.) NETWORK CONSERVATION STRATEGY.

AGENCY : State Government through Wildlife wing of State Forest Department; NGO's.

TIME FRAME : Medium term.

TEXT : PA's are the store houses of the maximum Biodiversity amongst wild ecosystems. In Chhattisgarh 10.6 % of the forest area is covered under P.A. network which is distributed amongst 11 WLS and 3 National Parks. These areas are most sensitive indicators of environmental changes. Slight change in the any of components of meteoric or edaphic or aquatic factors gets reflected in this typical ecosystem at comparatively faster pace than in other ecosystems. So P.As in the State are the most Biodiversity sensitive areas to be addressed. The strategy and action plan for the conservation of P.A.s need to incorporate the components of rich germ plasm protection, sustainable conservation of rich species diversity; reducing man-animal conplicts and eco-development in P.A.s

SPECIFIC ACTIONS :

- **Wild life and their habitat conservation shall be declared priority sector at the State level for which funding both from GOI and State Govt. be raised multifold.**
- **The proposals moved by the Wildlife Institute of India, regarding extensions to Bhairamgarh, Badalkhol and Sitanadi WLS and creation of new PAs in Gollapalli (Dist. Bastar) and Hasdeo Basin (Dist. Bilaspur) be implemented immediately.**
- **We should fully tap the potential of wildlife tourism as an integral component of Nature Tourism.** The revenue earned from wild life tourism should be used entirely to augment meager financial resources available for wildlife conservation and for the economic development of locals both inside and outside PA's
- While strengthening protective measures against traditional threats to wildlife, we should also respond to newer threats such as toxic chemicals and pesticides.

- **Greater support from the committed non-governmental organisations engaged in wildlife conservation should be sought.** Mainstream media should better highlight their activities.
- **All lands falling within 10 sq km. of the boundaries of National Parks and Sanctuaries should be notified as Eco-fragile zones under section 3(v) of the Environment (Protection) Act and Rule 5 Sub-rule 5(viii) & (x) of the Environment (Protection) Rules; so as to prohibit any ecologically & environmentally hazardous development/ industrial activity.**
- Vacant posts in the frontline staff of Protected Areas shall be filled immediately.
- Initiatives such as hiring local wild life experts on voluntary or honorarium basis, raising donations from corporate sector in implementing conservation programmes in PA' s need to be explored.
- Every Protected Area should be managed only by forest officers trained in wildlife management. **Training in specific areas like fire protection, habitat manipulation, wildlife census operations and eco-development be imparted to local inhabitants as compensation towards curtailment of their rights to ensure livelihood security.**
- **Research on identifying mitigation measures to reduce human-animal conflicts be carried on priority.**
- **Provisions for crop insurance should be introduced by State.**
- **A local working group consisting of professionals, public representatives and civil society engaged in wild life conservation shall be constituted for each PA to monitor implementation of the Wildlife Management plan of that P.A. These working groups would play a supportive role to State Wild Life Advisory Board.**
- **Looking into the rising man-animal conflict in and round PA's; degradation of habitat, & thus endangering livelihood security of local populations; each PA should be declared into Core and Buffer Zones. Core should be declared as sanctum sanctorum with zero human disturbance where as Buffer be managed as Multiple Use Area on the principle of co-existence.**

- The Intra –State & Inter State corridors proposed be developed and maintained to sustain wild life conservation efforts by undertaking inter habitat connectivity studies.
- **Relocation of domestic livestock be done from Core to Buffer zone should be speeded up and their immunization against viral; bacterial diseases be done on a regular basis.**

PROJECT : SUSTAINABLE DEVELOPMENT OF GROUND WATER THROUGH ENVIRONMENTALLY SOUND INTEGRATED APPROACH.

AGENCY : State P.H.E. Deptt., Central Ground Water Authority ; Forest Deptt., Irrigation Deptt.& Civil society.

TIME FRAME : Medium Term

TEXT : Spatio– temporal variations in rainfall, and regional / local differences in geology and geomorphology have led to uneven distribution of ground water in different regions across the State. Over draft and associated water quality problems are increasing. Besides, the occurrence of high contents of fluoride, arsenic, iron etc in ground water because of industrial pollution is also cause of concern. Deterioration of water quality, in major agricultural and industrial belts and urban complexes of the State, though not presently perceptible may crop up in days ahead.

Thus the necessity for proper conservation and utilization of ground water arises from the need to ensure:

a. Balanced development of the resource,
b. Equitable distribution among various users,
c. Sustainability of sources,
d. Protection against pollution,
e. Conservation for use at a later date,
f. Planning of resource augmentation projects,
g. Planning of re- use and recycling.
h. Protection of environment and eco-system.

SPECIFIC ACTION POINTS :

If the ground water resources are to be developed and managed sustainably, three important operational management strategies should be implemented:

1. **Understanding of resources availability and its vulnerability should be enhanced.**
2. **Resources managers and decision makers should recognize ground water as a crucial component of water resources and the environment, and**

3. **Knowledge and understanding of the ground water system and the environment should be transferred to the ground water users so that consensus- driven, sustainable management plans will be achieved.**

Integrated management of groundwater would incorporate following aspects :-

- **Ground water Targeting and Prospects Mapping.**
- **Proper ground water recharge estimation.**
- **Ground water draft estimation**
- **Ground water balance stage of development.**
- **Identification and mapping of over- exploited areas.**
- **Integrated watershed Management**
- **Conjunctive use of surface and Ground water.**
- **Application of new technology options like water saving devices, crop diversification and subsurface drainage.**

PROJECT : POLICY & LEGISLATIVE MEASURES TO CONTROL GROUND WATER EXTRACTION AND RECHARGE.

AGENCY : State Govt. through State Ground Water Board, Central Ground Water Authority, Municipalities, Panchayats and Civil society.

TIME FRAME : Medium term.

TEXT : It is a well known fact that the State is not a ground water-deficient. Water run-off is excessive in rainy season and aquifer being of limited size gets fully recharged during rainy season. But since the shape of the aquifer is such, that the recharged aquifer during the summer gets discharged also very fast leading to scarcity in summer. Thus the problem is lack of planning in collecting the surface run-off during monsoon period. The geological formations in the State are such that recharging of permanent aquifer by man-made attempts is just not possible. Extraction of surface water can be the only way of conservation so that the water collected in rainy seasons can be used as a supplement along with the ground water, diminishing the percentage of ground water usage (against the total use).

After the State formation; the State has embarked upon a process of rapid industrilisation & has also introduced Crop Rotation Policy. These initiatives are bound to put heavy stress on ground water. Thus converting rain fed and marginalised lands of the State to more productive lands so that village commons have resources to buy food is a big challenge facing the State. In this challenge good ground water management can turn tables.

❖ GENERAL STRATEGY

Water use should be consistent with the principles of ecologically sustainable development in following ways:-

- Governments (State and Local) should offer leadership in water conservation through policy and by example.
- Water conservation strategies should be adaptive and able to respond to technological, economic, environmental and social change and to differences between catchments and aquifers.
- Water conservation should be promoted and exercised by all users and managers in all water use sectors.

- Developing institutional and legal framework for participatory watershed development in rain fed lands since these lands support one of the poorest tribal population of the state.
- Water conservation should encompass a comprehensive range of measures and tools, including education, regulation, incentives, pricing, research, water reuse and technological development.
- Water should not be used for a purpose where water of a lower quality could be used more efficiently and economically.
- Water quality should be recognised as a factor which significantly affects the availability of water for various uses.
- Water conservation measures should be focused initially on strategies, which will achieve the greatest effect at the least cost to the community appropriately.

❖ **SPECIFIC POLICY MEASURES :**

- Integrating water conservation principles into policy and legislation.
- **Creating partnerships between the Government, stakeholders and users to demonstrate and implement a commitment to water conservation in the State.**
- Auditing water resources in order to accommodate beneficial uses more appropriately.
- Ensuring that decision-making in Chhattisgarh related to water is based on ecologically sustainable development principles.
- **Recognising best traditional practices in water conservation by instituting awards, which celebrate and promote achievements in water conservation.**
- Pricing and valuing water according to full cost recovery principles and using it for its highest net value in order to enhance environmental protection.
- **Providing direct financial incentives to encourage water users in all sectors to invest in conserving water and achieving efficiencies.**
- **Improving water efficiency in the industrial and commercial sectors to achieve cost savings.**
- Achieving water use efficiency in the agricultural sector to create improved efficiency of production.

- Developing a transparent planning process that identifies water conservation targets and provides meaningful goals for water use efficiency.
- **Encouraging the reuse of waste water and sewage effluents in order to reduce the demand on existing water sources.**
- **Ensuring that water conservation is supported and practiced throughout the State by launching special education and awareness programs.**
- Reviewing technical guidelines to provide water users with appropriate information to enable them to take more effective water conservation actions.
- **Undertaking research and development of innovative technologies, processes and methodologies that can be used in the urban and agricultural sectors to achieve water conservation.**
- Developing improved methods and performance indicators for evaluating water conservation measures and planning most appropriate future actions.

SPECIFIC ACTIONS :

The strategy would incorporate following actions: -

- **Identification of hot spots of surface water preservation with the help of geo-hydrological maps.**
- **Erection of under ground dykes (or other structures which are essential) to check under ground water flow on the selected sites.**
- Rajiv Gandhi Watershed Development Programme and annual scarcity works should focus on the construction of rain water conservation and harvesting structures.
- **Strengthen Central Ground Water Board and Underground Water Survey Division of the State in order to facilitate monitoring all the Ground water conservation and exploitation aspects.**
- **Irrigation pattern and calendar (zone wise) be updated by the water resource department with advice of Central Ground Water Board.**

- **Rejuvenating localized cost effective community based rain water harvesting management, especially since the state has existence of large number of Nistar ponds in the villages. Sustainable water management if executed by improvising traditional institutional practices, can become the biggest cooperative enterprise in the state.**
- **Identifying traditional & innovative ground water recharge measures for rain water harvesting in forest areas for enhancing agricultural yield of forest proximity rain fed lands.**

FINANCIAL FORECAST

As per the Estimate given by the concerned departments.

PROJECT : **DOCUMENTATION AND CONSERVATION OF TRADITIONAL BIO-CULTURAL PRACTICES AND CPR MANAGEMENT REGIMES.**

TIME : Continuous process (Pilot phase to be of short term)

AGENCY : Deptt. of Agriculture, Forests, Tribal Welfare, Culture; Sericulture, civil society; Panchayats and scientific community.

TEXT : Tribals and other indigenous people of the state, residing in and around forest areas, have rich cultural traditions and practices, having a direct or indirect impact on B.D. But there has been an erosion of these traditional values over the years. Common Property Resources are being perceived as an open access by marginalised populations without any accountability for its sustainability. Thus there is an urgent need to document traditional natural resource based practices and management regimes to analyse the forces responsible for the changed mind set of local populace and then build up the mechanisms to rejuvenate these bio-cultural linkages.

SPECIFIC ACTIONS -

1. **Inventorization of both traditional destructive and non destructive bio - cultural practices including tenurial arrangements for biodiversity loss.** The studies should include information on the spatial distribution of such practices vis-vis various species / communities.
2. **Identify Resource person in each village or for cluster of villages to regularly update the People BD register.**
3. **Rejuvenate the traditional village level institutions and mechanisms built for the management of the natural resources in order to build up a sustainable institutional network for CPR management.** This should be done with the active involvement of locals by permitting free, frank and open village level meetings.
4. **Bio-cultural Fairs be organised at Panchayat; District and State level,** regularly so as to create mass awareness about sustainable Bio-Cultural practices.
5. Adoption of sustainable practices in agriculture, fisheries and forestry for the conservation of biodiversity. This with then necessitate.
    - Following IPM approach .

- Give incentives for traditional cultivators including crop diversification.
- Maintaining forests with maximum possible diversity.

6. **Empowering village-level natural resource cooperative committees by Trust building. Major incentives to individuals or communities need to be announced by the State so as to untap especially Herbal knowledge by announcing Awards; ploughing back of royalties for the development of communities**.
7. Apply participatory rural appraisal techniques regularly in order to strengthen the existing Joint Forest Management institutional structure.
8. **Participation of women in natural resource management needs to be strengthened**
9. **Strengthening the already existing forest extension network for expanding the logistic base to villagers interested in Agro- forestry / Farm Forestry, and link it with forest based industries potential.**

PROJECTS : IDENTIFICATION, INVENTORY AND THE STUDY OF THE IMPACT OF EXOTIC SPECIES ON THE SUSTAINABLE CONSERVATION OF BIODIVERSITY.

AGENCY : Agriculture University Raipur; Ravishankar University, R&D wing of State Forest Department, TFRI Jabalpur.

TIME FRAME: Medium Term.

TEXT : A wide range of habitats and environmental conditions make Chhattisgarh especially vulnerable to the establishment and dispersal of seeds of alien species like Parthenium, Eupatorium Lantana, Rangia, Eucalyptus, Pines etc. which are basically of foreign origin.

The State has a long history of intentional introduction of exotic species in livestock , Agriculture and forestry, proven to be productive elsewhere and offering potential economic benefits to the State.

Many invasive species have found a place in literally every terrestrial ecosystem, including forests, grassland, croplands, residential areas in cities. Aquatic ecosystems are also effected. Agriculture seeds are the best carriers of such damaging and widespread unintentional introduction.

SPECIFIC ACTIONS :

1. **Identifying exotic and beneficial species.**
2. **Identifying invasive but harmful species.**
3. To study the impact of invasive and harmful species on the Bio-diversity.
4. **Identification of hotspots of invasive and harmful species.**
5. **Developing strategies and action points to counter the impact of these species.**
6. Monitoring and Publishing of norms / indicators for the spread of invasive species.

PROJECT : BRING INTO FORCE AN EFFECTIVE POLICY AND LEGAL FRAMEWORK FOR CONSERVATION AND SUSTAINABLE UTILIZATION OF BIO RESOURCES .

AGENCY : State Government through concerned State Deptts, Chhattisgarh Minor Forests Produce Federation, GOI (MoEF)

TIME : Medium term.

PROPOSED ACTIONS :

1. Owing to delayed regulation of land status; land disputes between Forest and Revenue departments have been on the rise. Due to lack of joint demarcation from 1986 onwards; many instances of issuing land pattas by Revenue Deptt. on forest-lands have come to notice. Ultimate end of every such instance was unfortunately the fragmentation of Bio- resource. Hon' ble Supreme Court has directed the State to complete **the task of settling revenue- forestland disputes in a fixed time frame.** This task should be completed on an immediate basis.

2. **THERE IS A NEED FOR A STRONG POLITICAL WILL TO REGULATE DIVERSION OF FOREST LAND FOR NON-FORESTRY PURPOSES, BY STRIKING A BALANCE BETWEEN CONSERVATION AND DEVELOPMENT.**

   Various non forestry activities especially Forest Land diversion for Power Projects, New State highway/widening of existing State highway & National highways. Hydroelectric Projects, open cast coal and iron ore Mining projects and sensitive issues of Forest Encroachment Settlement, Shifting Cultivation, Provisions regarding Grazing in Forest areas, Maintenance of unproductive livestock need to be addressed by adopting a balanced approach cutting across the party lines.

3. **Promoting sustainable utilisation of natural populations of medicinal plants , non-timber forest produce and fresh-water fish populations by introducing suitable policy measures.**
4. **Review of all existing State as well as national laws, Acts and resolutions related to Bio-diversity and making suitable amendments in order to meet the requirements of the various policy initiatives indicated in the CBSAP.** After the identification of the deficiencies and

shortcomings in the existing laws, there is a need to redefine the jurisdiction limits of law enforcement agencies.

5. **State level natural resource laws and regulations also should be amended suitably to incorporate greater participation of local communities to support biodiversity activities. Also local's ownership and equitable sharing of benefits flowing out of the sustainable utilisation of bio-resources should be protected by making suitable laws.**
6. The concerns shown in Action point no. 2 as well as provisions proposed in the Central Bio-diversity Bill 2000, there is an urgent need to have an exclusive State legislation for the conservation and sustainable utilization of biodiversity. This is being ensured by framing an exclusive **Chhattisgarh Bio-diversity Conservation Bill.**
7. After a systematic survey; and identification of the endangered flora and fauna; appropriate legislation should be introduced for their conservation; and provisions of penalties for violation and rewards for outstanding conservation efforts should be introduced.
8. Access fees, Incentives to encourage prudent and Penalties to discourage non sustainable utilization of Biological Resources and Biodiversity should be introduced.
9. Develop legislation on priority for handling local genetic resources, use of indigenous technology and knowledge and upgrading it through the use of biotechnology and distribution of its benefits.
10. Develop holistic plan for integration of PA' s and other land use planning.
11. To ensure the participation of locals right from planning to implementation and monitoring of Bio-diversity conservation strategies, there is a need to decentralise the whole mechanism in such a way that local concerns, rights and knowledge base is not only protected but actively involved in the whole decision making process. This would also be in line with the channels proposed in the Central Bio-diversity Conservation Bill 2000.

A State level Bio-Diversity Conservation Board along with a State level executive committee is proposed. This State level Board would be assisted by a three tier Bio-diversity Conservation Committees at the District, Panchayat and Gram Sabha level.

12. The need for Environment Impact Assessment (EIA) has grown in the present day with rapid industrial growth and the spate of development projects coming up in ecologically fragile areas. Increasing industrialization is fast swallowing up areas that are valuable repositories of biological diversity and thus intensifying conflicts between competing interests of development and conserving the environment. In this context, it is indeed alarming that there are few legal mechanisms available for restricting environmental degradation and industrial pollution. It is equally disconcerting that there are very few legal instruments that prescribe active measures for the conservation of biological diversity. The Environment Impact Assessment Notification, 1994 (herein after the EIA Notification) is one of the few regulatory mechanisms through which environmentally unsustainable development projects and industries responsible for environmental offences can be brought to book.

    So, there is a dire need to have foolproof mechanism to compel the private as well as Govt. under takings, to implement EIA provisions strictly.

SPECIFIC TO PA NETWORK: -

13. Introduction of well established wild life management practices especially related to habitat management in PA' s**Such scientifically tested, area specific habitat manipulation practices should become a mandatory part of all the management plans of PA's.**

14. **Investment in the Wild Life conservation in non PA areas should become State priority** and the state funding should be enhanced appreciably treating Wild Life habitat regeneration in non PA areas at par with the regeneration of economically viable timber species.

15. **Law enforcement agencies must ensure that those engaged in poaching, illicit trade in wildlife and Wildlife products, destruction of their habitat, and such other illegal activities are given quick and deterrent punishment**.

16. **Forest Conservation Act, 1980 be amended to prohibit any diversion of forest land for non-forestry purposes within 5 Sq.Km. of any Protected Area.**
17. Removal of encroachments in Protected Areas; be done immediately and final Notifications of PA' s be done on priority basis.
18. **The Wildlife Protection Act mandatory provisions for relocating populations inside PA's should be implemented in Buffer Zones. But the settlement of rights even in buffer zones of WL Sanctuaries should not be in such areas which are crucial and integral part of the wildlife habitat.**

SPECIFIC TO GROUND WATER: -

19. **Rain water harvesting in urban areas be made mandatory either through a separate legislation or policy.**
20. Legal provisions be made to assure that no surface water harvesting from any source (like ponds, canals, wells, rivers etc.) is done in kharif season.
21. Documentation and recording of every dug well or tank whether on Govt. land or private land be made mandatory.
22. **Approximately 5% area of every village common land be marked for development of rain water harvesting water bodies.**

PROJECT : DOCUMENTATION, COMPILATION AND MONITORING OF AVAILABLE BIO-RESOURCES AND ECOSYSTEMS MAPPING.

AGENCY : Gram Sabhas & Gram Panchayats; all B.D. related State departments especially Forests; Agriculture; Fisheries Veterinary, Directorate of Indian Systems of Medicine, the District and Panchyat level BD Conservation Committees, Scientific Community from State as well as from National level Govt. organisations and Civil Society.

TIME : Short term (1-5 Years)

TEXT : Residing well in the core of a bio-resource rich Mega BD area, the State is prone to bio-piracy. Chhattisgarh is particularly rich in herbs of medicinal importance, and has a wealth of over 23,000 kinds of paddy only. But the documentation done till date is incomplete since vast tracts of both terrestrial and aquatic ecosystems remain unexplored. The documentation of available bio-resources is must in order to protect the rights of the locals before the Central Biodiversity Bill is finally passed.

Documentation will be done at two levels – first at field level for primary data, and then in labs for secondary data.

SPECIFIC ACTION PROPOSED: -

A. Primary Data Documentation:-

i.e. Compilation of Community-Based Inventories -

1. **Since the local communities have the best knowledge of availability of bio-resources, the primary documentation of biodiversity should start at the village level itself. At local level, Panchayat Secretary, Forest Guard, Village elderly persons, Teacher, Patwari or Kotwar would act as primary documenters for the people's Biodiversity Register.(containing information provided by the community on Bio-resource as well as Bio-cultural public domain knowledge). The on going project of Jan Rapat should be used to complete the process of primary documentation. It is suggested that no survey or documentation of bio-resources be done in any ecosystem without the knowledge and concurrence of village, Panchayat and district level biodiversity committees.**

2. **The modalities of filling, upgrading and maintaining B.D. Register would be decided by proposed District, Panchayat and Gram level B.D. Committees in consultation with Collector and Divisional Forest Officer. Monitoring of the primary data documentation would be done by appointed nominees of major B.D. related departments.**
3. Entries made by Village level resource persons will be approved in Gram Sabha with new entries be made on the spot. This would help in the documentation and continuous up gradation of folk and other public domain knowledge linked with biodiversity.

B. Secondary Data Documentation: -

i.e. Compilation of scientific Inventory : -

All concerned Biodiversity related State departments should launch special programmes to document bio-resources seeking the help of universities in the State, organizations (definitely not externally aided) from outside the State like TFRI, ZSI, NBRI, IVRI etc. after obtaining primary data from the process enlisted in A.(1) above. Build up a strong Digital database in the areas specified below which should also get continuously upgraded after regular monitoring.

1. **Compilation of Status of threatened micro and macro flora and fauna in Terrestrial and Aquatic ecosystems.**
2. **Compilation of threats status of local herbal flora.**
3. **Identification and Inventory of Biodiversity Indicators of Pollution.**
4. **Identification and Inventory of Biodiversity Indicators of Habitat Quality.**
5. **Identification, Inventory and Monitoring of Exotic and Invasive Species.**
6. **Establishment of Herbaria, Museums and Electronic Data Base.**
7. **Satellite imagery based mapping of forest habitats.**
8. **Satellite imagery based mapping of aquatic habitats.**
9. **Establishment of a Geographical Information System for ecological habitats.**
10. **Wild life corridors studies.**

PROJECT : **ESTABLISHING INTERNATIONAL INSTITUTE OF AGRO AND HERBAL BIODIVERSITY STUDIES.**

AGENCY : State Govt. and Corporate Sector.

TIME FRAME: : Medium term.

TEXT : The State' s richness in Rice diversity is probably the best in the world. Similarly the State also possesses richness in the Herbal plant diversity and the traditional healing practices. But unfortunately most of this knowledge though in the public domain is largely undocumented. There is a need to untap this vast treasure by undertaking systematic studies & research in the fields of socio-economic impacts, in-situ & ex-situ conservation, local species breeding, genetic engineering, health, environmental impact practices etc. The research and development in these fields would not only conserve the local species germplasm but also would create avenues for the utilisation of this germplasm on commercial lines. This would boost up the revenue earnings of the State, a percentage of which too would be ploughed back for the economic well being of the local populations.

This multi disciplinary Institute would not only act as a Premier Institute in the country for carrying out multi disciplinary research in the fields of Agro & Herbal Diversity but would also act as Nodal Institute for carrying out all the R&D work related to the bio-diversity related fields in all the scientific institutions with in the State.

SPECIFIC ACTIONS:

- **To seek international assistance both for technology transfer as well as for joint research projects and to create facilities of International standard for carrying out: -**
  - **Genetic studies Establishment of**
  - **Bio technology Genomic DNA Libraries**
  - **Establishment of medicinal plants, cultivated plants, fish, indigenous livestock, poultry, genetic resource centers.**
  - **Socio-economic studies.**
    - **A. Studies on livelihood implications of biodiversity loss.**
    - **B. Studies on health implications of biodiversity loss.**

C. Studies on implication of tenurial arrangements for biodiversity loss.

- Establishment of a GIS for ecological habitats with interactive networking with other national organisations & global agencies.
- **Inventorying and carrying out genetic engineering studies to evolve new genetic combinations of domestic species (GMO's) in order to improve Agro, livestock and herbal medicine production in the State.**
    - **Facilitating specific R&D studies regarding Processing, and Marketing of local agro crops, minor forest produce and herbal plants in order to create a conducive environment for the establishment of related industries in the State.**

PROJECT : LARGE SCALE EXTENSION OF NON-CONVENTIONAL ENERGY SOURCES.

TIME : Medium term.

AGENCY : State Government, CREDA , Corporate Sector and Civic Society.

TEXT : The State already is a power surplus state, but it is predominantly thermal based. Thermal based power generation is environmentally hazardous and thus could prove over a long run a threat to the conservation of Biodiversity. Forest biomass based fuel economy in the rural areas is the biggest threat to the regeneration of the crop diversity in the wild ecosystems. Also because of the typical topography of the State, the remote rural areas can not be connected to national grid, and thus would depend heavily on power generation from non-conventional energy resources.

SPECIFIC ACTIONS :-

1. **State must have a pro-active policy on the exploitation of renewable as well as non renewable resources of energy especially in the solar, micro-hydal, and bio-gas based (being a rice bowl).**
2. **The State should encourage private sector investments, in power generation from Renewable Energy Resources.**
3. **Forest Department should raise large scale energy plantations to supply raw material for bio-gas power generation. In the initial stage being the relatively new and costly technology, it would need support from State government in terms of awareness, incentives and subsidies. High cost of Renewable Energy can be nullified against the social & environmental benefits.**
4. **The State Electricity Board should create an attractive and conducive policy environment through the provision of remunerative prices, fiscal incentives and back up financial support. This is possible through direct and indirect subsidies especially to make it affordable for bio-resource dependent populations living within the vicinity of forests.**
5. **The populations living in and around forest areas can be supplied with LPG. The initial investment could be offset by a subsidy. Making smaller sized cylinders with the capacity of 5 Liters. would**

enable poorer households to enter the LPG market. This would not only nullify the adverse impacts of firewood collection on adjoining forests, but would go a long way in improving the quality of life in number of ways.

6. Although there are improved models of fixed wood chulhas, these are often not able to combust agricultural waste. **Investment in promoting these chulhas, and research in adapting them to the needs of rural households could well be the answer.**
7. A technology that holds great promise for the future, especially in rural areas of the State with woodlots and weeds like lantana and ipomea, is the use of **biomass gasifiers**. These wood digesters are also capable of generating electricity.
8. **There needs to be greater investment in research and development followed up by effective packaging, promotion and appropriate incentives to draw people out of traditional practices and accept these new-age cooking fuels, and the chulhas that go with it.**

PROJECT : AUGMENT THE NATURE TOURISM POTENTIAL IN THE STATE IN ORDER TO STRENGTHEN BIODIVERSITY CONSERVATION & LOCAL ECONOMY.

AGENCY : Department of Tourism; Culture; Forest Deptt. **t**hrough Wildlife wing and Civil Society.

TIME : Medium term.

TEXT : Nature Tourism has three facets :-

- **Provides for conservation measures.**
- **It includes meaningful community participation.**
- **It is profitable and can sustain itself.**

Mexican architect and eco-tourism consultant Hector Ceballos-Lascurain, who is given the credit for introducing the term "eco-tourism", defined it as **"travelling to relatively undisturbed or uncontaminated natural areas with the specific objective of studying, admiring and enjoying the scenery and its wild plants-and-animals, as well as any existing cu1tural manifestations (both past and present) found in these areas".**

The International Eco-tourism Society (TIES) considers eco-tourism to be **"responsible travel to natural areas which conserves the environment and improves the well-being of local people".**

Broadly speaking then, the nature tourism demands more than paying a visit to the nature reserve. It demands *"responsible"* travel so that the impact of the ecological footprint is minimised and the benefits of travel trade are shared, not just with tour operators, but with local communities. This is not easy. But if done, many believe it could be the answer to creating an environmentally friendly, smokeless industry for the many beautiful but destitute regions of the State.

OPPORTUNITIES IN THE STATE –

Nature tourism has a potential to be used as a development option in the State for future. Thus this green industry in the State needs to be explored and developed with comprehensive planning and aggressive marketing strategies.

Comprehensive studies and experiences of field officers, coupled with interaction of rural population makes it crystal clear that bio-cultural attributions have a direct link with Nature Tourism. Thus inclusion of such rich bio-cultural attributes will add new horizons to Nature Tourism in the State.

Bio-cultural linkages not only make folk lore, folk dances, artisan art, carving art, bamboo utensil making, tribal festivals to be the base material for livelihood security of rurals, but at the same time it ensures addressing recreational, educational as well as conservation components also.

The State is full of conservation and recreational sites enlisted in Chapter-II and III which provide a unique opportunity for the growth of nature tourism in the State.

The CBSAP in Chapter –III has also proposed **Unique Bio-cultural Reserves** in the State which hold great promise for the development of Nature Tourism. They are **Futka Pahar, Pats of North Chhattisgarh, Khurshel Valley; Kurundi Forest Reserve, Abhujmar, Achanakmar WLS and Kanger Valley**.

SPECIFIC ACTION POINTS: -

The State offers potential for Nature tourism in the following areas:

Wildlife Tourism: -

- 3 National parks & 11 Wildlife Sanctuaries & provide a good canvass for wildlife conservation and education sites. Besides these PA's, Farsabahar block of Jashpur is famous as Naglok. Futka Pahar of Korba is famous for giant snake named "Pahar chitti."

Cave Tourism

- Kotumsar(Bastar) - for education purposes.
  - for subterranean fauna conservation.

Herpato Faunal Park

- **Farsabahar (Jashpur Distt.)** - for conservation of reptiles
- **Lemru Valley(Korba Distt.)** - for livelihood security of dependant population for creation of antidote of venom.

Herbal Medicine Parks: -

- Peoples Protected Areas(PPAs) formed in all the districts of the State

present a unique people participatory culture ensuring livelihood security through collection of local herbs, its semi-processing, manufacture of local medicines and display of Traditional Healing Practices.

Mushroom Parks

- North hills -
- Dandakaranaya -

for education and livelihood security.

Artisan Parks - For displaying Crafts such parks can be created in the respective districts.

Nature Reserve - Lemru Valley& Futka Pahar(Korba), Bagicha and Sanna pats(Jashpur), Mainpat, Shankargarh (Surguja), Abhujmar, Kurundi, Kurschel Valley,

Rice Parks - At Bastar, Sarguja, Raipur and Bilsapur displaying the genetic diversity of local paddy .

Mahasheer Fish park -Mahasheer fishes are unique fishes, whose population in many rivers & other water bodies of the State have dwindled in these years to the extent that its current status can be defined as near "non available." Selected rivers & water bodies inside the existing P.A. network would be selected and declared sanctum- sanctorum for Mahasheer to serve both the purposes of conserving local germplasm as well as developing Nature Tourism. Here all human activity will be highly restricted and catching of fishes would be only for the purposes of education; recreation and R&D and then releasing back to the waters.

This way it is proposed that Nature Tourism in the State by exploring and developing Nature conservation sites would not only fulfill the conservation of species in consideration (or culture as the case may be) but will also ensure peoples participation through job opportunities and thus will definitely sustain itself.

PROJECT : STRENGTHENING THE CIVIL SOCIETY INSTITUTIONS FOR THEIR ACTIVE PARTICIPATION IN BIO-DIVERSITY CONSERVATION.

AGENCY : State Govt. and Civil Society.

TIME FRAME : Long term.

TEXT : The State' s rich diversity in flora and fauna; as well as scientific community is well known but it is also extremely rich in committed, dedicated and sensitive civil society in form of NGOs, Nature clubs, Self Help Groups; and individuals. These individuals/ Institutions have been working in the field of various aspects of Biodiversity but with constraints of finances; manpower etc. Their works many a times remain unnoticed since there is no active interaction of the civil society with the concerned Govt. Deptt. in a formal and institutionalised way.

The amount of knowledge base with them is so immense that any Biodiversity conservation strategy at State; District; panchayat & village level can' t achieve desired success without the active participation of this vital sector.

There is a need to provide an adequate space to the civil society in terms of providing specific projects in planning; implementation and monitoring of B.D. related strategies in the State. This sector can also act as catalyst in creating awareness, motivating locals to participate in peoples participation programmes in CPR management of various Departments.

SPECIFIC ACTION :-

a. Identification of civil society network districtwise and fieldwise.

b. Grading of various civil society institutions/ individuals on the parameters of financial status, manpower potential, field wise level of expertise, funds used, awards etc.

c. The individual strategies formulated for the implementation of Biodiversity conservation have already incorporated involvement of civil society as one of the agencies. Thus each BD concerned Govt. Deptt. should identify civil society already working in the concerned field; identify specific areas of Biodiversity

conservation to be opened for civil society and earmark funds for selected tasks to be executed by civil society.

PROJECT : DOCUMENTATION, PRESERVATION AND ENHANCEMENT OF THE LOCAL GERMPLASM.

TIME : Continuous process.

AGENCY : State Govt. through Forest, Agriculture, Horticulture, Animal husbandry deptts.

TEXT : Exploitative production systems have depleted resources at an alarming rate in recent times. Modern production systems depend heavily on a few strains, breed types or crosses, in plants and animals. The local breeds or strains have therefore been neglected. Low economic viability has also contributed to endangerment and degeneration leading to extinction of certain forms of local genetic resources.

For example; as a matter of practice, prevailing today in Agriculture sector only the listed crops are purchased by the state government at support price and is distributed to the less privileged class on subsidised rate. If staple local agriculture crops are added into Public Distribution System (which are comparatively cheaper than the crops being purchased today), budget deficit will be lowered down, local people will be fed by the crops of their taste and also a market (which is the need of the day) will be opened for their local crops.

ACTION POINTS: -

(i) IN-SITU CONSERVATION PROGRAMME: -

1. Establishment of Grassland protected areas.

2 . Establishment of Mountain Ecosystem protected areas.

3. Establishment of Hill Myna Protected Area.

4. Establishment of Wild Buffalo Protected Area.

5. Establishment of Albino sloth bear Protected Area.

6. Establishment of Village ponds conservation sites.

7. Establishment of Irrigation Tanks conservation sites

8. Establishment of Honey Bee colonies conservation sites

9. Conservation of Sacred Groves

10. Conservation of Sacred Ponds.

11. Conservation of Sacred Trees.

12. Conservation of Urban Biodiversity.

13. People Participation Management of Orange Areas (Un-demarcated Protected Forest); village "Charnois" and village ponds.

14. Control of Exotic and Invasive species.

15. Strengthening the development of Medicinal Plant Conservation through People Protected Area (PPAs)

16. Establishment of subterranean Floral and Faunal Protected Areas.

17. Establishment of Rice accessions conservation sites.

18. Establishment of Mushroom conservation sites.

19. Establishment of conservation sites for local food crops such as Tubers, Kulthi pulse in Jashpur.

20. Establishment of Snake (Herpato Fauna) Protected Areas.

21. Establishment of on-farm crop genetic diversity of local breeds (in Agriculture, Livestock) conservation sites.

(ii) EX-SITU CONSERVATION PROGRAMME :-

- **Establishing an international level R&D center for agro and herbal biodiversity.**
- **Establishing of valuable and threatened species (both faunal as well as floral) genetic resource centers.**
- **Establishing of Achar (*Buchanania lanzan*), Aonla (*Emblica officinals*), Bija (*Pterocarpus manscpiur*), Bamboo (-------) seed resource centers.**
- **Establishing Botanical, Zoological Gardens and safari parks.**
- **Establishing cultivated (medicinal plants) genetic resource center.**
- **Biodiversity oriented urban forestry programmes.**
- **Breeding of indigenous livestock, poultry and pet breeds to maintain the animal genetic resource and to make them available to people.**

(iii) PROGRAMMES IN BIOTECHNOLOGY SECTOR: -

Biotechnology is one of the frontier technologies that is the focus of attention the world over. It has great potential for providing a wide range of benefits by application across sectors such as agriculture, animal husbandry, fisheries, human health, forestry and environmental protection.

The State has identified biotechnology as a thrust area and a comprehensive policy and action plan for research, education and application-centered development of biotechnology is presently under preparation.

A detailed sectoral analysis of the underlying potential and felt- needs to the state shall be undertaken to design programmes in subjects such as bio-informatics, agriculture, biotechnology (including in allied sectors like animal husbandry & fisheries), forest and environmental biotechnology, diagnostics therapeutic and pharmaco-genomics etc.

PROJECT : **TO BUILD UP A COMPREHENSIVE LEGAL AND POLICY FRAME WORK FOR PROTECTING IPR AS WELL AS ENSURING BENEFIT SHARING OF THE LOCAL BIO-RESOURCE AND KNOWLEDGE.**

TIME : **Phased manner** (First phase-short term)

TEXT : While the loss of plant and animal species is a cause for concern, developing countries are also waking up to the fact that pharmaceutical and biotechnology companies from the North are making huge profits from products developed from plant and animals genetic resources and knowledge of the South.

The concerns of indigenous people is pertinent since these people had cohabited intimately with the biodiversity, preserved it for centuries and knew of its many uses as food and medicine. Thus the community rights to wild and domesticated biodiversity needs to be recognised and a formal system of benefit sharing to compensate communities for the use of bio-resources and related knowledge by national or multinational pharmaceutical, agricultural and bio technology companies needs to be placed formally.

SPECIFIC ACTIONS:-

1. **Comprehensive inventorisation of species under all ecosystems should be completed in the first phase i.e. in the next 1 or 2 years in order to counter the patent claims.**
2. **Introduction of State legislation for prohibiting bio prospecting by Multinationals, externally aided organisations working within the country.**
3. **Sufficient legal protection needs to be provided to the indigenous knowledge systems by first making local populace aware of it. Understanding, assessing & formulating new patent laws and issues relating to IPR's is the immediate need of the hour.**
4. **Introduction of new laws on the use of domestic bio-resource or knowledge , and strict observance of such laws with stringent punitive measures.**

5. **A comprehensive State legislation to regulate, access and facilitate economic benefits of traditional knowledge for all sectors of society especially indigenous communities.**
6. **Build up of terms, conditions, rights and obligations in transactions dealing with the use of local genetic resources/ material especially dealing with third parties.**
7. **Terms and conditions need to be evolved especially with regard to rights and obligations; and benefit sharing while transferring genetic resources for commercial use and research.**
8. **To protect grass root innovations, a system of petty patents should be initiated. These must be easy to apply, quick to obtain. Cost of filing applications should be kept low.**
9. **Explore the possibilities of tailoring the "Pseudo-Innovators" against "local genuine innovations" That's why IPR application must disclose genetic material access, original source of information and prior public knowledge.**
10. **Local, national and international market informations be fed to the villages.**

PROJECT : CONSERVATION OF DOMESTIC LIVESTOCK ON SUSTAINABLE BASIS FOR THE ECONOMIC WELL BEING OF POOR.

AGENCY : State Government through animal husbandry department.

TIME : Long term.

TEXT : Sustainable management assumes special importance with respect to domestic animals as they are vital sources of milk, meat, hides, fiber, draught power, and manure. Thus the local livestock genetic resource needs to be preserved for giving a boost to local economy which can be achieved by following certain basic principles such as:

- Domestic animals are a part of global biodiversity and heritage of man-kind and should be appropriately conserved and utilized.
- Human societies all over the world have developed social and cultural bonds with certain species or breeds of animals. Numerous religious rituals, festivals, and folklore are interwoven with native domestic animals. In some societies, ownership of certain breeds is a status symbol.
- Animal production in the future will require new gene combinations. Only conservation of biodiversity can provide genetic variability and material for genetic engineering and developing more productive forms.
- Many minor breeds have not been exploited owing to their poor economic value and are thus rapidly decreasing in number. Minority breeds are also valuable reserves of genetic diversity and should be adequately recognized and exploited.
- Unplanned breeding has led to genetic erosion, dilution, and degeneration of some established breeds. Conservation becomes a vital necessity in such situations. Conserved germplasm can be used for reintroduction and revival of lost breeds.

GENERAL STRATEGIES FOR THE STATE: -

- Judicious and scientific management of local livestock breeds to progressively enhance their sustainability.
- Strategies for the preservation of less productive breeds with adequate genetic variability and distinctive characteristics as a part of genetic security.
- Alternate uses of the breed to ensure conservation be identified.

- Establishment of in situ and ex situ gene banks.
- Building of State level Livestock Conservation Boards/Conservation Units. Services of avid conservationists and committed NGOs should be sought in such ventures.
- Formulation of breeding policies with well defined objectives consistent with the economic conditions of the farmers, and ethos of conservation.
- Formulation of livestock population policy to ensure that animal populations are consistent with the carrying capacity and environmental management.
- Steps for people's participation in conservation programs through Breed Societies, Associations, Breed Survival Trusts and NGOs.
- Enactment of laws pertaining to data banks, gene banks, transfer/movement of genetic resources, patenting of genetic resources, prohibitive and punitive laws for preventing abuse, and misuse.
- Development of financial and institutional mechanisms that are mandated to support conservation of domesticated animals. It is obvious that sustainable management, coupled with enhancement of the economic returns are key elements for conservation. **However, less viable breeds should be supported being a part of the genetic heritage of mankind as well as to maintain genetic diversity.**
- **A reduction in bovine numbers, assumes high priority in the policy framework.**
- **Effective and timely conservation measures can retrieve the local breeds from extinction. Incentives and subsidies for upkeep and alternate usage of local breeds should be considered to address the problem.**
- **New biotechnological approaches have the potential for the conservation of genetic resources in the form of sperm, embryos, oocytes, isolated chromosomes, genomic DNA libraries, and isolated genes; hold promise for the preservation of animal germplasm, which cannot be retained in -situ due to poor production.**
- **Identification of available broad genetic base of local livestock from which move desirable characteristics could be selected, preserved and maintained through proper selection and breeding methods.**

SPECIFIC STRATEGIES FOR BASTAR REGION :-

Source: Central Eco-region Report by Mr. Dilip Gode.

1. For effective preservation of Aseel breed of poultry, it is proposed that the capacity of Govt. Aseel Breeding Farm, Jagdalpur may be enhanced from present 200 to 5000 birds. Further, a scheme may be launched for distribution of Aseel birds on exchange basis.
2. More para-vets can be recruited and given orientation training regarding importance of Aseel breed and the need for its presenvation along with ensuring their vaccination, deworming and health care at remote village levels.
3. Awareness generation camps can be arranged for making people aware of importance of artificial insemination in upgradation of " Desi" breeds of cattle.

PROJECT : **CREATING A FAVORABLE ENVIRONMENT FOR ESTABLISHING AGRO & FOREST BASED INDUSTRIES BY PROMOTING INVESTMENTS FROM CORPORATE SECTOR IN PRIVATE, DEGRADED WASTELANDS & FOREST LANDS.**

AGENCY : Private Sector; Farm community; Forest Deptt; Sericulture Deptt. & Civil Society.

PERIOD : Medium Term.

TEXT : The State offers unique opportunities for establishing Agro & Forest based industries due to the availability of rich species diversity in Herbs, NTFP' s, Timber, Bamboo, Agriculture especially Rice, Sericulture & Horticulture, biomass-based crafts etc. The State' s three agro climatic zones offer favourable physical environment for the excellent productivity of the species in the referred sectors. The socio- economic status of small & marginal farmers of the State can not afford investments for the second crop and thus their private lands too can be subjected to more productive use by raising agro and forest based industrial raw material.

Smelling the rising demands of industries for NTFP' s; Herbal & Aromatic Plants; the new State Forest Policy enshrined following policy initiatives :-

(a) Conservation of Minor Forest Products (MFP)

"..... Minor Forest Products like Tendu leaves, Sal seed, Imli, Chironji, Kullu and Dhawra gum, Kosa cocoon, Honey etc., form an essential element of the means of livelihood of the tribals and the landless, marginal farmers and other rural poor communities of the State."

" The State should take appropriate measures through the Chhattisgarh State MFP (Trade and Development) Cooperative Federation Ltd for sustainable utilization and long term conservation of all MFP found within the forests of the state.

" The State should take necessary steps for endowing the ownership rights of MFP on local communities as per the provisions of the Panchayat Upbandh (anusuchit chetron ka vistaar) Adhiniyam 1996."

(b)Conservation of Medicinal Plants

"…. In view of the richness of medicinal and herbal plants in the state, a mechanism should be developed for in situ and ex situ conservation, domestication and non- destructive harvesting with the active support . from local people including traditional healers and vaidyas.....".

(c) Forest based industries

" In consonance with the National Forest Policy 1988, forest based industries should be encouraged to produce their own raw material through private forestry and to use alternative raw material."

- **Direct relationship between forest based industry and farmers should be encouraged to meet the raw material requirements of the industry.** This industry-farmer collaboration should in no way be allowed to result in diversion of prime agricultural lands and displacement of small and marginal farmers.
- **"Appropriate institutional and technological systems should be developed to enable rural artisans to sustain their biomass-based crafts and enterprise."**

The VISION 2012 prepared by State Govt. also refers to this industrial potential in the following words :-

"Forestry has a significant role in the economic development of Chhattisgarh. 44% of the State is covered with forests, ranking it third in India in terms of forest cover. The State boasts of an abundance of minor forest produce like Tendu leaves, Sal seeds , Myrobolan, Mahua seed, Gum etc., which have enormous economic potential."

In the backdrop of such a favorable physical climate, aggressive policy initiatives by the State and availability of the vast tracks of govt. wastelands, Private lands and 60 lakh. ha. of degraded but potentially productive forest lands; the only constraint could be the massive financial investments needed to convert this rich bio-resource base into an industrial potential.

1. The basic objectives of this strategy is three fold:

   a. To augment income generation of small; marginal farmers by educating them; providing finances and ensuring buy back of the raw material grown as second crop on their fallow lands.

   b. To attract large scale private investments to raise the productivity of degraded, refractory wastelands and forest lands so as to not only meet the bonafide Timber & Energy requirements of the locals but also to provide additional income benefits to locals in the process of Benefit sharing.

   c. Private Sector investments would be permitted only when the Entrepreneur brings the latest technology package; finances the cultivation part and establishes Industries to process & convert the raw material into the final product within the State. A fixed percentage of the profits earned by the Industries is proposed to be ploughed back for infrastructural development of masses.

SPECIFIC ACTIONS:-

1. Identification of District wise available cultivable wastelands; Bhata lands, upto 0.4 density degraded forest lands & lands along the National, State Highways & Railways Tracks.
2. The suitability of these lands vis-vis species would be authenticated after having a detailed scientific analysis of geological formations; soil types, water table; and drainage etc.
3. Detailed authentic electronic data base of spatial distribution of these lands; their total quantum; species suitability and physical attributes would be prepared by using satellite imageries and GIS.
4. Extension wings of Agriculture; Forests; Horticulture; Sericulture & Directorate of Indian System of Medicine; not in isolation but in a cohesive way would then launch a massive awareness & extension programme amongst masses with the help of civil society Technology packages for site specific species cultivation would be then made available.
5. The State would form an exclusive Forest & Agro based Private Investment Board whose job would be to receive; scrutinize and

finalize corporate offers for investments in raising raw material for these potential industries.

6. Institutional & Legal frame work for permitting such Private investments ensuring equitable and fair Benefit sharing; amongst locals need to be developed separately in following three areas: -

   a. Private Entrepreneur and Individual Farmer lands

   b. Private Sector – Govt. lands (Non forest Lands)- Self Help Groups/ Cooperative societies / Gram Sabha / Gram Panchayat.

   c. Private Sector – Govt. degraded Forest Lands –Village Forest Committees / Forest Protection Committees / FDA' s. The proposed institutional arrangement under(c) needs to be carefully drawn so that it doesn' t violate the existing provisions of the Forest Conservation Act, 1980.

7. In order to grant full protection of IPR' s as well as ensuring equitable benefit sharing; the private sector in the State can play a vital role. The untapped traditional herbal knowledge and healing practices are either on the verge of being lost in oblivion or are facing onslaughts of bio piracy by MNC' s**The Private Sector can tap this knowledge by providing huge incentive in terms of Awards to individuals/ Communities and procuring Patent Rights in return. This vast unexplored area holds a great potential for establishing Pharmaceutical Industries in the State** which would go a long way in not only conserving local traditional herbal knowledge / practices but economic protection to the local communities.

7. Raising raw material for silk industry, and enhancing honey production by utilizing latest technologies in bee keeping and mushroom production(especially medicinal varieties) also hold a great promise for the industry.

PROJECT : **INSTITUTIONALIZATION OF VARIOUS HORIZONTAL AND VERTICAL LINKAGES PERTAINING TO TRADITIONAL MEDICINAL PRACTICES EXISTING IN THE STATE OF CHHATTISGARH.**

AREA : Whole Chhattisgarh.

AGENCY : Directorate of Indian System of Medicines and Govt. Pharmacy.

TIME FRAME : Short term.

TEXT : In Chhattisgarh, we have Ayurvedic, Unani, Homoeopathic, Biochemic, Acupressure and other local systems of medicinal practices. Directorate of Indian System of Medicines has a large infra structure in form of 336 dispensaries. They are directly linked with the Directorate and the govt. pharmacy. As on today, responsibility of supply of medicines lies with pharmacy, which buys them from open market.

The State forest deptt. has formed People' s Protected Areas(PPA) for conservation and utilisation of medicinal herbs. All the tasks starting from identification, selection of herbal species, their threat status and commercial exploitation are performed by the JFM committees who have been tagged to the PPAs.

SPECIFIC ACTION PLAN :

1. **Identification of local healers and the documentation of their healing practices**
2. **Formation of "Traditional healer Forum" at district level. This forum would be constituted of traditional healers representing all the herbal potential areas of the district. The representatives would have a term of only three months by rotation .**
3. District level Biodiversity Committee will have two representatives from this forum who too will work on rotation basis.
4. Identification of herbal plants potential areas (including PPAs) in the State.
5. **Documentation of all herbal species in the identified areas with the assistance of local healers and the assessment of Yellow, Red & Green lists of herbal species by undertaking threat status studies by Directorate.**
6. Yellow, Red and Green list of species area wise will then be handed

over to the Directorate.

7. Assessment of quality status of each herbal raw material.
8. **The traditional healer forum will develop vertical linkages through Ayurvedic doctors posted in the 336 dispensaries across the State. These doctors will act as technical coordinators between the Directorate and the forum.**
9. The forum would select best and unique traditional medicinal practices along with the drug combination and present such product samples to Directorate.
10. **The Directorate would finally select a sample drug / formula only after duly verifying its efficacy and then sign a MOU for selected samples with the local traditional healer .**
11. Directorate will hand over the Green, Yellow and Red lists of herbal species to the Forest Department(FD) with all necessary technical inputs. FD will then initiate in-situ as well as ex-situ conservation (as the case may be) projects.
12. In-situ conservation will be done with the sole responsibility of protection by PPA linked samities and the forum.
13. Herbs of green list collected by the JFM Samities will be handed over to pharmacy which in its turn will pay for quantity received, and prepare medicines.
14. These medicines will then be distributed to 336 centers through Directorate.

Financial Forecast As per needs of Directorate.

PROJECT : **IN-SITU AND EX-SITU CONSERVATION OF HERBAL PLANTS BEING TRADITIONALLY USED FOR LOCAL HEALING PRACTICES TO ENSURE LIVELIHOOD SECURITY OF THE TRIBAL OF THE STATE.**

TIME FRAME : Medium Term

AGENCY : Forest Deptt. and Directorate of Indian System of Medicines.

TEXT : Chhattisgarh is bestowed with more than 44% geographical area covered by forests. Unfortunately till date herbs of medicinal importance had been given back seat in planning. But the State being declared as a Herbal State. is bound to prove a boon for the conservation and propagation of herbal plants.

What we need today is proper inventory of herbal species, exploitation norms *vis-a-vis* threat status of available herbal resources, documentation of non-sustainable harvesting practices by the locals and a system of sustainable exploitation which can be linked with livelihood.

SPECIFIC ACTIONS: **A. FOR IN-SITU CONSERVATION :-** Area and Species specific.

This task will be done in following stages: -

i) Identification of herbal plants potential areas (including PPAs) in the State.

ii) **Documentation of all herbal species in the identified areas with the assistance of local healers and the assessment of Yellow, Red & Green lists of herbal species by undertaking threat status studies by Directorate.** Green list will incorporate the herbs which are in abundance in the area. Yellow list will be of the herbs which are available but their availability is either alarming or critical . Red list will be of highly threatened or totally extinct varieties which need to be conserved at first priority. Herbs of Green list will be exploited.

iii) Documentation of traditional but non-sustainable harvesting practices by the locals and then launching mass awareness and education programme amongst the collectors to adopt non-destructive harvesting practices.

iv) Formulation of sustainable norms for harvesting which should be

done keeping the threat status of the species in mind.

v) District wise and region wise list of Green, Yellow and Red list would be declared and at the same time quantities of Green species for sustainable harvesting would also be notified every year. Such declarations would be an annual affair depending upon the improvement in the status of the species in question.

B. FOR EX-SITU CONSERVATION: -

Ex-situ conservation would be carried out for the species categoriesed as below:-

i) **Primary Species :-** Out of GOI prioritization list , the species which are available in Chhattisgarh (IUCN list).

ii) **Secondary Species :-** Species other than primary species in Chhattisgarh but having both commercial and livelihood security values.

iii) **Tertiary Species :-** Species which are on the verge of extinction. Only the endangered and threatened species will be considered for the task.

TASK :

1. Ex-situ conservation would be done by establishing medicinal plants genetic resources centres in degraded forest lands by adopting latest cultivation techniques. The use of Biotechnology also would be introduced.
2. The task of ex-situ conservation is being carried out in all PPAs. Out of the total area allotted for in-situ conservation, 10 ha. would be identified every year for ex-situ conservation purposes. These sites will be developed as lab-cum-production centers. They will be established in vicinity to the area where species in question is found in wild also (But is threatened now).
3. Regular monitoring of all the insitu and ex-situ conservation activities would be done by the State Medicinal Plant Board.

PROJECT : **CREATING INSTITUTIONAL MECHANISMS FOR SUSTAINABLE HARVEST & MARKETING OF MEDICINAL PLANTS.**

AGENCY : State Govt. through Forest Dept., Tribal Welfare Dept. and Rural Development Dept.

SPECIFIC ACTIONS :

i) Providing legal cover to prohibit any marketing of Red and Yellow listed herbs.

ii) District wise and region wise list of Green, Yellow and Red list would be declared and at the same time quantities of Green species for sustainable harvesting would also be notified every year by the State Board. Such declarations would be an annual affair depending upon the improvement in the status of the species in question. The traditional healer forum, local Panchayats as well as JFM samities would be kept informed of such declarations.

iii) Collection of green listed herbs as per the declarations mentioned in point-ii. under strict monitoring of resource persons or communities authorized to do so.

iv) Nature of herbal trade will be free trade.

v) Services of reputed marketing agencies will be under- taken in order to explore the national and international markets.

vi) Licenses will be issued to traders by the State Govt.

vii) Transit from source of collection upto destination within the district boundaries, will be governed by Panchayats.

viii) Transit from district to other parts of the State or outside the State will be governed by Forest Produce Transit Rules.

ix) Creating a conducive environment for herbal based industries and pharmacies.

x) Royalties recovered from the traders will be used for the herbal diversity conservation programmes as well as welfare programmes for the collectors of herbs.

xi) **Besides these, the following steps will be taken for R & D.**

- Frequent exhibitions would be organized showing Floral diversity of Chhattisgarh in order to attract the attention of

buyers particularly international buyers.

- Preparation of herb availability Calendar.
- Launching of web portal on herbs with special emphasis on Chhattisgarh herbs. This web portal would be unique as it will be helpful to both local collectors and international buyers. The medium of website would be both Hindi and English. This website will provide.
    i. Latest rates in metros and international markets.
    ii. Weather and Pest infestation forecasting for herb growers.
    iii. Current trends in herb markets.
    iv. Regular on-line lecture on herbs.
    v. Interactive message board.
    vi. A beautiful and informative photo gallery for herb identification.

- Herbal Information Center (HIC) would be established in different potential zones with latest IT technologies (Following the example of Operation Flood)
- Industrial and other uses of common medicinal herbs are to be searched.
- Regular publications of Journals, Periodicals, Magazines, Technical Bulletin etc. would be done for documentation and awareness.
- Establishment of Dhanvantari Udyan in every district or in every potential zone in order to
    1. Show the common species at a glance.
    2. Provide information to representatives of buyers.
    3. This Udyan can be a source of genuine herbs (as Herbal Nursery) for common people and also for herb growers.

PROJECT : **DEVELOPING MECHANISMS TO FACILITATE ACCESS AND EQUITABLE SHARING OF BENEFITS FROM THE GENETIC RESOURCE BY THE LOCAL FOLK.**

TIME : Long Term.

AGENCY : Central Government/ State Govt.

TEXT : After dictating terms on geographic resources by North, the table is now turned on to intellectual and genetic materials of South. IPA, GATT, TRIPS, WTO, UPOV and EMR are some of the examples.

ACTIONS :

1. Local, national and global market information be fed to the villagers.
2. Make available the developments in patent field at global level to the people of the State.
3. Awareness campaign to the launched especially for patent and such other laws and their implications.
4. To protect grass root innovations, a system of petty patents should be initiated. These must be easy to apply, quick to obtain. Cost of filing application and maintenance be low. Petty patent officers can be appointed on the distt. level.
5. Explore the possibilities of tailoring the ' Pseudo-Innovators against folk genuine innovations.
6. Village level documentation of Bio-diversity knowledge is necessary.
7. IPR applications must disclose genetic material access, origin & prior public knowledge.

PROJECT : REJUVENATION OF TRADITIONAL BIO-CULTURAL INSTITUTIONAL MECHANISMS CONCERNING COMMON PROPERTY RESOURCE FOR THE REHABILITATION OF CPRs AND REBUILDING OF "SOCIAL CAPITAL"

AGENCY : Civil Society, Tribal Deptt., Forest Deptt and Local institutions.

TERM : Long Term.

TEXT : Social change is an inevitable process. One can alter its pace, direction but can never stop it. Modernization has changed the human mind in an ever-changing and materialistic entity. So there is a tendency to copy the society just over us in materialistic norms. This tendency has dented the age-old ethno forestry practices, many of which had sustainable utilization as the main philosophy. There existed trust within social relations, respect to elders and practice of sustainable utilization of bio resources in the vicinity. There existed a full proof equilibrium between demand and supply which was sustainable for bio-diversity also.

Our objective is to analyse highlight the policy makers perceptions to the CPR issue and the significant changes they brought about in the attitudes and approaches of rural communities. Also our purpose is to identify major underlying driving forces, responsible to accelerate degradation of community–level environment resources. The recognition and understanding of the above phenomenon may serve as an important step towards rehabilitation of CPRs as well as rebuilding of "Social Capital"

Analysts also feel that most of the governmental initiatives fail, because of a gap persisting in policy implementation tools and beneficiaries, owing to mistrust of local society in implementing agency.

In the backdrop of the above scenario, this strategy is thus being launched take a stock of the institutions; practices pertaining to CPR regimes of various bio resources which lasted long.

SPECIFIC ACTION POINTS :

1. Involve promotion of user groups of CPRs with the help of NGOs.
2. To accommodate diverse interest of economically differentiated rural communities the CPR re-development should also have strong focus on diversification of products and services

3. Focus should also be on the equitable distribution of gains using appropriate methods including some form of share holding system as tried in JFM and MFP collection in the State.
4. Constitution of traditional healer forum at district level.
5. It will also require a strong policy support in terms of legal frame work to encourage user group, transfer of control of local resources to local communities and provisions for investments in CPRs.
6. The need for catalytic role of civil societies to mobilize rural communities and help in their capacity building to undertake new responsibilities .
7. Status of Sacred Groves as centers of Bio-diversity Conservation needs to be documented.
8. **Injecting biodiversity concerns in the functioning of local institutions.**
9. **Institutional capacity development for civic bodies.**
10. Empowering the local communities to handle IPR issues.
11. Documentation of traditional conservation sustainable use practices.
12. Studies on social motivation for continuation-revival forces promoting dissolutions of traditional conservation sustainable use practices.
13. Documentation of traditional systems of management of knowledge of uses of biodiversity.
14. Studies on livelihood implications of biodiversity loss.
15. Studies on health implications of biodiversity loss.
16. **Organising Bio-cultural fairs**

- **THE UNSUSTINABLE ACTS WHICH TOO WOULD BE ADDRESSED**
    1. Uncontrolled grazing by non-descript and unproductive live stock being maintained purely as a social status symbol.
    2. Irrecoverable loss to regeneration during fuelwood collection by headloaders.
    3. Legislative advocacy for settling forest land encroachments
    4. Exploitation of locals by middlemen in NTFP collection

5. Destructive & over exploitive harvesting practices for NTFP and Herbal Plants collection.
6. Man-induced fires in forest areas.

- **ACTION POINTS TO ADDRESS SOME KEY BIO-DIVERSITY STAKE HOLDERS**

A. HEADLOADER

(i) By creating alternative source of employment or engaging them in Forest nurseries in the area.

(ii) Providing non-conventional energy source to them.

B. GRAZIER

(i) Go for live stock improvement programs, reducing the non-descript livestock on exchange basis and producing healthy off-springs suiting to area.

(ii) Introducing stall feeding through cattle camps through mass awareness

(iii) Raising Silvipasture plantations in charnoi lands and degraded forest lands.

C. FOREST ENCROACHERS

Strict compliance of the existing national laws and Hon' ble Supreme Court directives.

D. SNAKE CATCHER CLUB

There is a good potential of Bio-resource usage in livelihood security. Snakes and other herpatofauna are concentrated in many parts of the State. Venom of the poisonous snake is worth paying. There are locals who can catch the snake, squeeze venom out and leave the snake again. Venom of krait is worth approximately Rs. 15,000/- per gram. If a snake park is developed and snake catchers are engaged, it can be ideal conservation utilization model.

Financial Forecast :

PROJECT : **REHABILITATION; CONSERVATION AND SUSTAINABLE UTILISATION OF WETLANDS.**

AGENCY : State Govt. through State Ground Water Board, municipalities, State Environmental Conservation Board and scientific community.

TERM : Medium term

TEXT : Wetlands include rivers, canals, man-made canals, and village ponds. Village ponds in Chhattisgarh are part of traditional water harvesting system. As on today there are 46817 tanks in Chhattisgarh, out of which 36034 are in active use. The wetlands which had been, and are still being managed as CPR in the State, predominately fall in two categories.

1- small seasonal tanks at village level having water depth up to 1 meter which dry up every year by December.

2- Large village tanks which do not dry up at all, and have water round the year. Many a times depth of water in these tanks exceeds 1 meter, even in summer.

Both of these categories of ponds are local **"Natural Bio-diversity Sanctuaries"**

These tanks (which are mostly used for Nistar) still continue to be an important and valuable component of the State' s socio-ecology.This wetland resource has a potential not only to supplement the existing irrigation facility, but also creating excellent opportunities in the State for long strides in pisciculture.

Other wetlands in form of rivers and canals can also be nouned as **"aquatic floral & faunal sanctuaries"** with unique ecosystem characteristics of their own, but are threatened by over-exploitation due to population pressures, encroachments, pollution and silting due to the degradation of their catchments

So a comprehensive strategy to rehabilitate and maintain vigour of these water bodies as well as sustainable conservation of flora and fauna there in, can be drawn as follows :-

SPECIFIC ACTIONS:

1. Superior analyses of these wetlands is needed to design interventions for conserving and raising the productivity of these water bodies.

2. Identification of wetlands in the State as per the norms of Central Ground Water Board as well as Ramsay Convention.
3. Documentation of available micro and macro flora and fauna, wetlands wise.
4. Mass awareness campaign with the support of civil society against domestic and industrial pollution of the wetlands.
5. Study of changes of animals / plant life or food chains in wetlands due to prevailing non-sustainable practices.
6. Implementation of a comprehensive and integrated watershed management package having vital components like improving the drainage pattern, rehabilitation of catchments, integrated sewage treatment measures etc.
7. Facilitate to understand the productivity, equity and sustainability issues involved in the existing institutions of Nistar ponds management.
8. Establishing a network of supply channels woven around the main supply channel linking village ponds in order to enhance the vigour and productivity of the ponds systems. This can be done by investing in improving the existing alignments and redesigning them in order to maximize the harvesting and storage of rainfall precipitation.
9. Efforts should be made to augment some minimum tank storage for a specific period which can facilitate pisciculture.
10. Design the appropriate management policy for restoring and improving the productivity of these village ponds.
11. By upgrading the status of these ponds to irrigation level after networking, they should be used for implementing crop diversification strategies.
12. Ponds rehabilitation options like desilting and deepening that restore the original standards should be given top priority.

PROJECT : **EMPOWERING AND MOBILISING THE MARGINALISED LOCAL POPULATION BY ADDRESSING THE PROBLEM OF "ECOLOGICAL POVERTY" AND DEVELOPING NATURAL WEALTH BASED LOCAL ECONOMY.**

AGENCY : State Government through CEO and Gram Panchayat.

TERM : Medium Term.

TEXT : ' Ecological poverty' can be described as the lack of an ecologically healthy natural resource base that is needed for a human society' s survival and development. High levels of ' ecological poverty' today prevent a large part of the world' s poor from helping themselves to improve their economic condition. Healthy lands and ecosystem, when used sustainably, can provide all the wealth that is needed for healthy and dignified lives.

Villages in the State are usually highly integrated micro-ecosystems especially those situated in the sub-humid hill, mountain and plateau regions. These are highly integrated agro-silvi-pastoral systems. In other words, each of these village has its own croplands, grasslands, and tree or forest lands, and each of these land-use system interact with each other. Development in one component invariably has impact on the other.

What we need today is the holistic enrichment of these village ecosystems. For this attempts would have to be made to increase the productivity of all the components of village ecosystem- from its grazing lands & forest lands to its croplands, water systems and livestock – and in a way that this enrichment is sustainable. Currently rural development efforts are extremely fragmented and quite often these efforts are contradictory and counter productive. **The only way to end these fragmented approaches is to promote integrated village ecosystem planning.**

This stupendous task of planning for every village can be achieved, rapidly and judiciously only if it is participatory. It can be assisted by Govt. machinery but can' t be done by it. Despite the fact that large scale migration occurs annually in the State to towns, experience shows that villager still relates well to their immediate village ecosystem- their crop lands, their grazing lands, their tree and forest lands, their animals and

their ponds and tanks. And it is the need of the hour that at this level; they can act most easily and readily , given the appropriate framework for action.

SPECIFIC ACTION POINTS : -

The most important goal of villages ecosystem planning for biomass regeneration will have to be :-

a. **Enhancement of total natural resource base of the village ecosystem;**
b. **Production of basic biomass needs of the village community on a priority basis ;**
c. **Equity in the distribution of biomass resources**

Thus if these village bio-resource are to be managed in both sustainable and justified way; following three principles of control, unity and equity need to be observed :-

1. **The commons must be brought under the control of the village communities which doesn't mean transfer of ownership especially with regard to forests.**
2. **The entire community must be involved in the protection of the commons under any formal or informal institutional setup.**
3. **All the members of a group will protect a common resource only if all of them know that they will benefit from the resource equally.**

PROJECT : **ENSURING CONSERVATION, PRESERVATION, SUSTAINABLE UTILISATION OF LOCAL AGRO-GERMPLASM**

AGENCY : IGAU, Agriculture Department Farm Community and Civil Society.

TIME FRAME : Long term.

TEXT : Chhattisgarh State is nicknamed as "Rice Bowl of India". This is because the State maintains maximum number of rice accessions, probably the best in the world. Out of 19,095 characterized rice accessions collected in erstwhile MP by late Dr. Richharia & his team; 15,018 accessions were from Chhattisgarh.

A systematic collection of Rice germplasm of undivided MP was started in 1971 by late Dr. R.H. Richharia and the task continued for ten years. Besides 19095 accessions collected in this decade, during 1992-93 a wide range of wild rice (oryza nivana) accessions were again collected during 1992-93.

Indira Gandhi Agriculture University (IGAU) has increased its bank of local Rice germplasm upto 22,972 --- **THE LARGEST COLLECTION OF RICE BEING FIELD MAINTAINED BY ANY INSTITUTE IN INDIA.**

Agro-Scientific community; local press and NGO' s have long been demanding that there is an urgent need for the proper documentation and information dissemination of the research material collected so far in order to preserve this diverse germplasm from the onslaught of bio-piracy. It has also been felt that the agriculture scientific community should lay thrust on further R&D on the material collected so far. It is essential to extract economic gains from local germplasm conservation & propagation for the livelihood security of local populace as well as build up export potential of this rich bio-diversity.

SPECIFIC ACTIONS SUGGESTED :-

1. **Already collected local Rice germplasm needs to be characterized and evaluated; and brought in the public domain.**
2. **The characters & locality of individual accession, be converted into electronic data base and published in public domain.**

3. This Rice germplasm be maintained scientifically and the storage facilities be improved with latest technology inputs.
4. Isolation, Purification, Identification and characterization of so far collected germplasm be completed on short term basis with latest genetic engineering skills
5. In-situ conservation of this local germplasm with innovative intercropping field trials (along with Ex-situ conservation) be promoted with the active cooperation of local people.
6. Mechanism to be developed to pluck the gap of information sharing between Agro-resources, communities and governmental agencies.
7. **A separate legal cell in the Agriculture University to protect the IPR of communities growing these rice varieties be established.**
8. **Movement of any local agro-germplasm or its knowledge outside the State for any use should be strictly prohibited i.e. not without clearance from the State Bio-diversity Board.**

PROJECT : IMPLEMENTATION OF URBAN ENVIRONMENT REHABILITATION PLAN BY LAUNCHING ECO-TOWNSHIPS PROJECTS IN RAIPUR, DURG, BHILAI, KORBA & BILASPUR.

AGENCY : Municipalities & Chhattisgarh Environmental Conservation Board .

LEVEL : State Level

TIME FRAME : Medium term

TEXT : The State Housing and Environment policy is aimed at promoting environment consciousness by strengthening the machinery of the State pollution control board. This would also involve tightening the implementation of the environmental laws and supporting the setting up of common effluent treatment plants and facilities for collection and disposal of effluents and hazardous wastes and improving the quality of life of citizens. The policy also advocates that measures will be undertaken wherever reasonable and practical, and with due regard to public interest, to ensure that the costs of environmental degradation are borne by the persons(s) responsible for the degradation.

SPECIFIC ACTIONS :-

The townships of Raipur, Durg, Bhilai, Korba & Bilaspur have poor sanitary and living conditions, inadequate infrastructure, pollution and unplanned development; and thus there is an urgent need to improve living conditions of these townships .

This would be done by undertaking eco-rehabilitation projects in these townships. The project should be financed from the funds provided through a well organized public-private partnerships; where in Govt., private businesses and civil society groups will pool their resources and skills. If need be technical assistance could be sought from Central Pollution Control Board. Implementation of the projects would be done by the municipalities of these townships under the technical guidance of Chhattisgarh Environmental Conservation Board .

The plan would be to tackle infrastructure development issues such as green spaces, parking spaces, reducing vehicular and industrial pollution and setting up of common effluent treatment plants and facilities for collection and disposal of effluents and hazardous wastes by constructing waste disposal sites.