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PART - I

COMPENSATORY AFFORESTATION IN THE STATE OF CHHATTISGARH

1. Introduction

1.1 The State of Chhattisgarh came into existence on 1st November, 2000 by separation of 16 Districts (now 18 Districts) of Chhattisgarh region from Madhya Pradesh. Chhattisgarh is situated between 17° 46' N to 24° 6 ' N latitude and 80° 15 ' E to 84° 51 ' E longitude in Central Eastern part of India. The total geographical area of the State is 136.03 thousand sq. km and it is larger than 16 other Indian States.

1.2 Geographical Features

Geographically, Chhattisgarh is divided into three distinct land areas viz.,

- Chhattisgarh Plains
- Bastar Plateau and
- Northern Hill Zones.

In the North of the State are the mighty Satpura Ranges, in the center plains of river Mahanadi and its tributaries and in the South is the plateau of Bastar. The border of Chhattisgarh is touched by the State of Uttar Pradesh in the North, Jharkhand in the North East, Orissa in the East, Andhra Pradesh in the South and South East, Maharashtra in South West and Madhya Pradesh in the West.

1.3 Demographic Characteristics

Total population of the State is about 20.79 million with 16.62 million people residing in rural area constituting more than 75% of the total population. The Scheduled Caste and Scheduled Tribe population constitutes more than 45% population of the State. The literacy rate is 65.12% as compared to the national rate of 65.38%. The literacy rates are still lower in rural areas particularly in tribal Districts like Bastar, Surguja, Jashpur and Raigarh Districts.

1.4 General Climatic Features

The general climate of Chhattisgarh State is dry sub-humid type. The State receives annual rainfall ranging from 1000 mm to 1600 mm in various parts of the State. About 90 to 95 percent of this precipitation is received during south-west monsoon season (June-October). The monsoon sets in around 10th June at the tip of the Bastar area and covers the entire area by 25th June. Months of July and August are the wettest months.

1.5 Soils of Chhattisgarh

The soils of Chhattisgarh vary considerably in the three agro-climatic zones. Though the nomenclature is different, the types of the soils, especially, the physical properties are the same. The different soils that exist in the three agro-climatic zones are as follows:

Chhattisgarh Plains	Bastar Plateau	Northern hills
Bhata (Lateritic)	Marhan (coarse sandy)	Hilly soils
Matasi (Sandy loam)	Tikra (sandy)	Tikra
Dorsa (clay loam)	Mal (sandy loam)	Goda chawar
Kanhar (clay)	Gabhar (clay & clay loam)	Bahara

The first two categories of the soils in the three Agroclimatic zones are very light type of soils with very low water retention capacity.

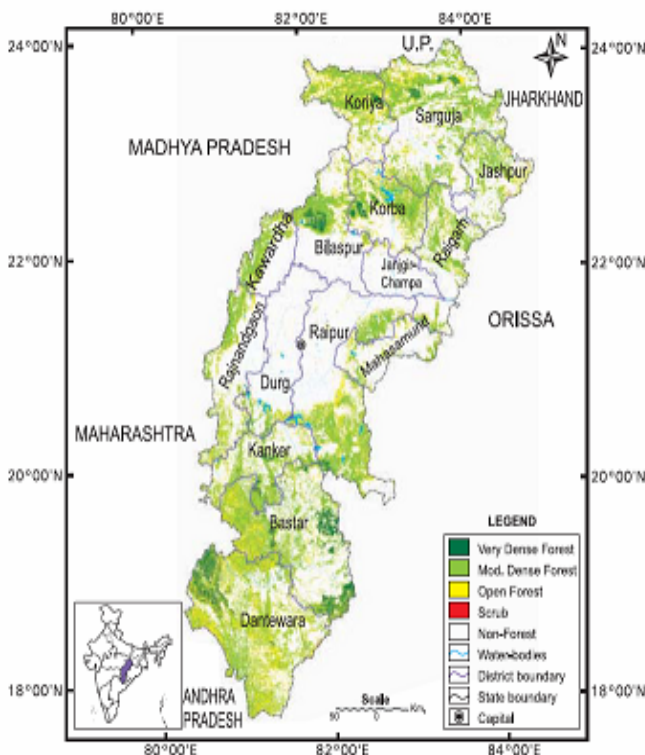
1.6 Agro-climatic Zones of Chhattisgarh

Agro-climatically, Chhattisgarh may be divided into 3 distinct agro climate zones with immense potential of agro-forestry development.

Sl. No.	Agro-climatic Zone	Districts
1.	Northern Hills	Surguja, Koriya, Jashpur nagar and Dharamjaigarh Tehsil of Raigarh District
2.	Chhattisgarh Plain	Raipur, Mahasamund, Dhamtari, Durg, Rajnandgaon, Kabirdham, Bilaspur, Korba, Janjgir and part of Kanker District (Narharpur & Kanker block) along with part of Raigarh District
3.	Bastar Plateau	Jagdalpur, Dantewada, Bijapur and remaining part of Kanker District

1.7 Agriculture

Agriculture is the main occupation of more than 80 per cent of the population of Chhattisgarh. Paddy is the main crop of the State and due to abundance of production of paddy, Chhattisgarh was earlier known as 'Rice Bowl' of Central India. Mono cropping of rice is predominant while other crops grown are lathyrus, linseed and chickpea as relay crops (Utera). Chhattisgarh comes under sub-humid climate and receives 1000 m.m. to 1600 mm of rainfall. Though this amount is quite sufficient for growing rice crop but due to erratic distribution of rainfall, frequent dry spells and heavy rainfall at times causes crop failure and adversely affect the economic conditions of the farmers.



Forest Cover Map of Chhattisgarh State

2. Forest & Wildlife

The State of Chhattisgarh has 59772 sq. km (44% of its geographical area) under forests that forms catchments to atleast four main river systems, i.e., Mahanadi, Godavari, Narmada and Ganges. Major rivers of the State are Mahanadi, Indravati, Hasdeo, Sheonath, Arpa and Ib. The State has 3rd largest forest cover in the country. The forest cover of the State is estimated as 55863 Sq.Km. according to Forest Survey of India assessment (2005). Out of it, the extent of very dense forest is 2256 sq km, moderately dense forest 36472 sq km and open forest 17135 Sq.Km.

The State of Chhattisgarh being placed in Deccan bio-geographical area, houses an important part of that rich and unique biological diversity. The State is significantly rich in respect of many plants having medicinal importance. The Forests of the State fall under two major forest types, i.e., Tropical Moist Deciduous Forest and the Tropical Dry Deciduous Forest. Sal (*Shorea robusta*) and Teak (*Tectona grandis*) are the two major tree species in the State. Other notable overwood species are Bija (*Pterocarpus marsupium*), Saja (*Terminalia tomentosa*), Dhawra (*Anogeissus latifolia*), Mahua (*Madhuca indica*), Tendu (*Diospyros melanoxylon*) etc. Amla (*Embilica officinalis*), Karra (*Cleistanthus collinus*) and Bamboo (*Dendrocalamus strictus*) constitute a significant chunk of middle canopy of the State's forests.

DISTRICT & WISE FOREST COVER (CHHATTISGARH): YEAR - 2005 (Area In Sq. Km)

District	Geographic area	Forest Cover				Percent of G.A.
		Very Dense	Dense Forest	Open Forest	Total	
Bastar	14974	750	5142	2126	8018	53.55
Bilaspur	8270	222	1,681	598	2501	30.24
Dantewara	17634	746	6,245	4,337	11328	64.24
Durg	8549	31	513	223	767	8.97
Janjgir-Champa	3852	4	51	101	156	4.05
Jashpur	5838	3	1,577	622	2202	37.72
Kanker	6506	124	2,171	837	3132	48.14
Kawardha	4223	0	1,245	365	1610	38.12
Korba	6599	149	2,186	1,016	3351	50.78
Koriya	6604	54	2,607	1,475	4136	62.63
Mahasamund	4789	0	561	395	956	19.96
Raigarh	7086	0	1,883	659	2542	35.87
Raipur & Dhamtari	16486	47	3,831	1,575	5453	33.11
Rajnandgaon	8068	3	1,716	817	2536	31.43
Surguja	15731	123	5,063	1,989	7175	45.61
Total	135191	2256	36,472	17135	55,863	41.32

Source:- State of Forest Report 2005: Forest Survey of India

Biogeographically, the State falls in Deccan bio-region comprising representative fauna of central India like the Tiger (*Panthera tigris*), Leopard (*Panthera pardus*), Gaur

(*Bos gaurus*), Sambhar (*Cervus unicolor*), Chital (*Axis axis*), Nilgai (*Boselaphus tragocamelus*) and Wild Boar (*Sus scrofa*). The State is a proud possessor of rare wildlife like the Wild Buffalo (*Bubalus bubalis*) and Hill Myna (*Gracula religiosa*) which have been declared as State animal and State bird respectively. Apart from the species diversity, the State is also endowed with rich genetic diversity. The variation in the genetic composition of individuals within or among floristic and faunal species is large.

3. People's Participation In Forest Management

The involvement of communities in forest management is now a significant feature of national as well as State Forest Policy. The State has begun community-based initiatives in executing forest schemes / programs. A new JFM Resolution, specifying clear guidelines regarding formation of JFM committees, allocation of rights and duties among the communities and sharing of benefits to communities has been issued in Nov-2001. Through this new JFM Resolution, the State has begun a process of transition from user-centered approach to multi-stakeholder, community based approach. The objective behind this new approach is to make local communities stakeholders of the forests, not simply user of its products. This approach will address a range of forest management goals, including forest protection, forest development and poverty alleviation and economic benefits to community living in / near forests. The State has initiated the following measures:



JFM Committees

At present, there are 7887 Joint Forest Management Committees known as Forest Management Committees in Chhattisgarh State.

Background

Chhattisgarh with a population of 20.80 million accounts for 2.0 percent of the country's population and about 4.1 % of its land area. Forests cover about 41.42 % of the State geographical area, which extend over approximately 1.35 million hectares. The forest cover accounts for 8.26 percent of India's total forest cover. These forests are rich in biodiversity and are a home for a number of valuable species of flora and fauna. They are also an abode for a number of tribes like the Gonds, the Pahadi Korbas, Abujhmarias and the like, who represent the rich cultural heritage of the region.

Mining Activity

Chhattisgarh is rich in natural and mineral resources. Not only forests of the State are rich with precious herbal and medicinal plants but mineral resources. Chhattisgarh has huge stocks of Coal, Bauxite, Iron ore and 28 types of minerals are found in the State. Existence of high quality Kimberlitic pipes (Diamond) has been traced in the State. Chhattisgarh ranks second in terms of mineral productions in the nation. 23% of the Iron ore deposits of the nation exists in Chhattisgarh and the State is among 3 prominent coal producing States of the nation along with Jharkhand and Orissa.

Under the Scheduled Tribes and other traditional Forest Dwellers (Recognition of Forest Right) Act, 2006

The forest dwellers who have been residing in forest for generations in order to strengthening the conservation of the forests while ensuring livelihood and food security, Govt. of Chhattisgarh has considered 2,37,546 number of persons eligible till the date 13.12.2005. In order to comply the Act, 2006, as first phase of distribution of Tenural Rights eligible persons of 65744 Nos. to the date 24-10-1980 have been considered out of which 56787 nos. persons were distributed with Forest Rights till February 2009.

Site specific Compensatory Afforestation

In Chhattisgarh forest area has been diverted for various development projects. The State has laid emphasis on increasing the irrigated area which is well below national average. In addition diversion for transmission line, roads and other development works which are directly benefiting the rural people have been taken up.

Abstract

Site specific Compensatory Afforestation in lieu of forest area diverted

(Amount in lakh Rs.)

Circle	Diverted Area (in ha.)	Proposed Compensatory Afforestation area (in ha.)	Amount Required
Raipur	661.054	1386.429	897.52
Bilaspur	3171.160	3973.640	2313.29
Kanker	336.663	703.888	336.37
Durg	277.092	494.804	206.23
Jagdalpur	519.741	1033.488	563.69
Sarguja	769.034	1538.068	883.99
Total	5734.744	9130.317	5201.09

PART - II

CHAPTER-I

FORESTS OF CHHATTISGARH

1 The Forests

Forests in the State can be broadly categorized into:

- Sal Forests
- Teak Forests
- Miscellaneous Forests
- Salai Forests
- Open and Scrub Forests
- Bamboo Forests.

Sal Forest

Sal forests are by and large found in the districts of Rajnandgaon, Kanker, Bastar, Bilaspur, Jashpur, Surguja, Korea, Raipur and Kawardha, it extends about forty percent of the total forests of the State. The predominant species found here are *Shorea robusta*, *Terminalia alata*, *T. arjuna*, *T. bellerica*, *Anogeissus latifolia*, *Dalbergia latifolia*, *Madhuca indica*, *Buchanania lanzan*, *Boswellia serrata*, *Strerculta urens*, *Cleistanthus cofitnus*, *Adinacordifolia*, *Prerocarpus marsupium*, *Diospyros melanoxylon*, *Dendrocalamus strictus*, etc. Occurrence of Sal in these forests ranges from 20% to 80 % in natural stands.

Teak Forests

Teak forests are by and large found in the districts of Rajnandgaon, Kanker, Bijapur, Bastar, Raipur and Durg. It constitutes about 10 percent of the forests of the State. The predominant species found here are *Tectona grandis*, *Terminalia alata*, *T. arjuna*, *T. bellerica*, *Anogeissus latifolia*, *Dalbergia latifolia*, *Madhuca indica*, *Buchanania lanzan*, *Boswellia serrata*, *Strerculia urens*, *Cleistanthus cofitnus*, *Adina cordifolia*, *Pterocarpus marsupium*, *Diospyros melanoxylon*, *Dendrocalamus strictus*, etc, Occurrence of Teak in these forests is up to 20% in natural stands.

Miscellaneous Forests

The forests in many parts of the State are miscellaneous type with no single species dominating. They constitute about fifty percent of the forest of the State. The species that are commonly found in the canopy are *Xylia xylocarpa*, *Pterocarpus marsupium*, *Adina cordifolia*, *Anogeissus latifolia*, *Terminalia alata*, *T. arjuna*, *T. belierica*, *Mitragyna parviflora*, *Ougenia dalbergeioidis*, *Kydia calycina*, *Mangifera indica*, *Diospyros melanoxylon*, *Buchnania lanzan*, *Dalbergia latifolia*, *Gmelina arborea*, *Lanea coromandalica*, *Lagerstroemia spp.* *Dendrocalamus strictus*, etc. Such Forests are predominant in Bilaspur, Raigarh, Raipur, Surguja. Besides, these forests are rich in biodiversity and are the home for a variety of herbs, shrubs and climber that are valued for their medicinal properties.

Open and Scrub Forests

A sizable extent of forests in Chhattisgarh are degraded or in different stages of degradation. In some cases such forests have degraded to the extent of attaining the status of scrub vegetation. The causes of such acute degradation are many. Biotic factors in the form of grazing pressure, removal of firewood for domestic use and annual fires and resultant non-establishment of regeneration are some of the causes that have led to this massive denudation.

Bamboo Forests

Natural Bamboo occurs, in large tracts of forests in the State. The predominant species of Bamboo is *Dendrocalamus strictus*. *Dendrocalamus strictus* is widely distributed even in relatively drier localities. Bamboo occur gregariously as a middle storey in the natural stands in patches. However they are seen to grow copiously in areas with relatively wide canopy openings. Bamboo forests are found in districts like Rajnandgaon, Kanker, Dantewada, Bilaspur, Raigarh.

1.1 Status of Forests and trends in Forest Management in Chhattisgarh

The forest resources in the State, as elsewhere in the country, are under tremendous pressure and as such suffer from degradation. Production of wood from the forests had declined considerably in the last twenty years preceding the mid 1990s. Forest management over the period had been inadequate. Population in villages inside and near forests has multiplied leading to enormous pressure on forests. In addition, there was increasing pressure to convert forestland into agriculture especially in the poverty stricken tribal areas of the state. However, management through the concept of Joint Forest Management (JFM) has had a salutary effect on forest.

The Government of Chhattisgarh has been implementing various programs and schemes relating to forest development as per the National Forest Policy. To meet the challenges in the forest sector in the State, a State Forest Policy was announced during 2001. The state policy statement among other things addresses the following issues:

- Conserving and improving the existing Forests
 - Forest Management Planning
 - Forest protection
 - Appropriate silvicultural interventions in Sal, Teak, Bamboo and miscellaneous forests
 - Rehabilitation of degraded forests
 - Soil and Moisture Conservation measures with watershed approach
- Strengthening Social Forestry Activities
 - Promoting Social Forestry / Farm Forestry
 - Liberalization of restrictions on timber transport
- Streamlining Forest Management Strategies
 - Institutional capacity vis-A-vis Functions of Forest Department
 - Applied Research and Extension
 - Addressing Financial Constraints
 - Monitoring and Evaluation
- Encouraging People's Participation in Forest Management
 - Joint Forest Management
 - Enabling Issues like according legal status to community participation in forestry, capacity building and skill Upgradation, dovetailing with rural development etc.

- Inter Sectoral Co-ordination
- Conserving Bio-diversity and Genetic Resources
 - Conserving Biodiversity
 - Eco-Tourism
 - People's Participation in Bio-diversity Conservation activities

It is in this backdrop the present project has been formulated.

1.2 Project Objective

Alleviation of poverty in the forest fringe villages to improve management of forests with the participation of the local community by;

- Regeneration and development of forests
- Checking land degradation, deforestation and loss of biodiversity
- Protection, Conservation of natural resources through active involvement of the people
- Employment generation for the local communities
- Human Resource Development

1.3 The Project Components based on Priority are

- Forest Development (Assisted Natural /Artificial Regeneration)
- Forest Protection
- Development of Protected Areas & Bio-Diversity Conservation
- Infrastructural Development and staff amenities
- Research & Development
- Chhattisgarh Rajya Vanoushadhi Board (Development of Medicinal Plant)
- Working Plan & Information Technology in Forest Management Practices, Capacity Building
- NTFP Processing Unit

1.4 The Project Outlay

The total project outlay is **Rs. 884.28** Crores

1.5 The Project Period

The proposed project period is for five years from 2009-10 to 2013-14

To sum up, the project aims at managing forest resources that would give sustained income to the rural people while improving the ecology and environment keeping in view National Forest Policy 1988 and State's Forest Policy 2001.

CHAPTER-II

FOREST DEVELOPMENT

(ARTIFICIAL REGENERATION AND REHABILITATION OF DEGRADED FORESTS)

Introduction

The State of Chhasttisgarh has 59772 Sq.Km. of area under forest cover which is about 44% of the total geographical area of the State. As per forest survey of India report 2005 on forest cover, an area of 17135 Sq. Km. is either degraded or open forest. The degradation of forests has resulted in decreased production of timber and Bamboos, resulting in -

- Decrease in employment opportunities for forest dwellers.
- Decrease in availability of fuel wood, Bamboo and small timber for daily use.
- Decrease in production of minor forest produce resulting in decrease of income to the forest dwellers.
- Soil erosion and increased run-off resulting in lowering of water table.

There is tremendous biotic pressure on these forests that will further degrade them if immediate steps to regenerate and rehabilitate these areas are not taken up. The degraded areas may be regenerated either by obtaining coppice shoots by cutback operation of malformed, pollarded trees and singling of the coppice shoots. The open areas may be filled up with the plantation. The degraded Bamboo areas may be brought back to the productive state by removing congestion in congested clumps and soil working.

2. Works proposed to be undertaken from CAMPA Funds

- Plantation of miscellaneous tree species
- Bamboo plantation
- Rehabilitation of Degraded Bamboo Forest
- Rehabilitation of Degraded Forests (Assisted Natural Regeneration and thinning / Cleaning Operations in plantations)
- Construction of Forest Headquarters building at new Raipur

2.1 Plantation of tree species

- The prescription of working plans of the State prescribe plantation on 8800 ha. every year under Plantation Working Circle
- 10000 ha. of degraded orange areas / degraded area of other working circle suitable for plantation needs plantation
- The funds available are not sufficient to carry out plantation on above suitable land
- 28000 ha. is proposed to be planted up with miscellaneous tree species in five years from CAMPA funds
- The amount required for year 2009-2010, 2010-2011, 2011-2012, 2012-2013 and 2013-14 is estimated to be Rs. 1295 lakh, Rs. 2191 lakh, Rs. 2436 lakh, Rs. 2741 lakh and Rs. 1267 lakh respectively. The total amount for five years would be to the tune of Rs. 9930 lakh.

2.2 Bamboo Plantation

- The state has an area of 6556 Sq.Km. under Bamboo forest cover which is about 11% of the forest area
- It is proposed to increase Bamboo cover
- 25000 ha. of Bamboo plantation is proposed in five years from CAMPA funds
- The amount required for year 2009-2010, 2010-2011, 2011-2012, 2012-2013 and 2013-14 is estimated to be 1260 lakh, Rs. 1550 lakh, Rs. 1769 lakh, Rs. 1978 lakh and Rs. 663 lakh respectively. The total amount for five years would be to the tune of Rs. 7220 lakh

2.3 Rehabilitation of Degraded Bamboo Forests

- Out of total Bamboo area of 6556 Sq.Km. of the State, 2.66 lakh ha. Bamboo forests are in state of degradation
- The degraded Bamboo forests have congested and degraded Bamboo clumps which could be brought back to the productive state by cleaning them and by soil working around periphery of the clumps
- 40000 ha. of degraded Bamboo forest is proposed for treatment in five years from CAMPA funds
- The amount required for year 2009-2010, 2010-2011, 2011-2012, 2012-2013 and 2013-14 is estimated to be Rs. 240 lakh, 320 lakh, Rs. 415 lakh, Rs. 450 lakh and Rs. 490 lakh respectively. The total amount for five years is estimated to be Rs. 1915 lakhs

2.4 Rehabilitation of Degraded Forests (Assisted Natural Regeneration and thinning / cleaning operations in Plantations)

- Forest department harvests about 65000 ha. of area under Selection cum Improvement Working Circle and Improvement Working Circles. The areas of worked coupes need cleaning operation in the subsequent year. In such cleaning operation, the singling of multiple coppice shoots and removal of malformed shoots is carried out. Because of non-availability of sufficient funds, the cleaning operations are left unattended
- In worked coupes, 6th year cleaning is also prescribed in working plans. The 6th year cleaning is also left unattended due to paucity of funds
- The plantations carried out under various plantation schemes are maintained for 4 years from the year of creation. In 6th year, these plantations need cleaning. For 6th year cleaning operations, there is no provision in plantation schemes or in harvesting schemes
- For 1st year and 6th year cleaning operation in worked coupes and 6th year thinning and cleaning operations, in the plantations, an amount of Rs. 75.35 lakh is proposed to utilize from CAMPA funds
- The amount required for year 2009-2010, 2010-2011, 2011-2012, 2012-2013 and 2013-14 is estimated to be Rs. 1300 lakh, 1500 lakh, Rs. 1525 lakh, Rs. 1525 lakh and Rs. 1685 lakh respectively. The total amount required is Rs. 7535 lakhs

2.5 Construction of Forest Head Quarters Building at New Raipur

- After the formation of the State, the Office of Forest Department is running in the office building of Conservator of Forests Raipur Circle.

- The Capital complex is under construction at New Raipur.
- State Government has allotted an area of 4.5 acre in New Raipur for construction of Forest Head Quarters Building.
- An amount of Rs. 3000 Lakhs of CAMPA fund is proposed to be utilized for the construction of Forest Office Headquarter building.

2.6 Financial implications of the Components

- Total 5 year financial outlay: Rs. 29600 Lakhs
- Year wise Action plan for the project period for 5 years commencing from the year 2009-10 till 2013-14 is given in the Annexure -1.

CHAPTER-III

FOREST PROTECTION

3 Introduction

The forest area in Chhattisgarh is 59772 Sq. Km. These forest being rich in timber species, excellent species diversity, fertile soil-rich in minerals are always prone to illicit felling, encroachments, biotic interferences leading to forest fires and related negatives. Therefore, the forest protection aspect becomes all the more important in order to maintain the biodiversity and check the degradation of forests both in terms of age wise and species wise composition of the crop. The dwindling forest area is yet another challenging task before the forest managers.

The average area of a beat under the administrative control of a Beat guard is around 18 Sq. Km. with ever increasing population pressure it is genuinely very difficult to effectively protect the precious area single handedly against the odds of illicit felling, encroachment and other related menaces.

3.1 Objectives

- To improve the quality of growing stock by minimizing the biotic interference.
- To prevent the illicit felling and unlawful removal of forest produce.
- To curb unauthorized mining activities in forestland.
- To prevent any unauthorized use of forest area for non-forestry purposes.
- To increase the mobility of field staff.
- To strengthen the existing barriers and existing control room.

3.2 Area Proposed For Treatment

The entire area needs thorough treatment against illicit felling, encroachment, biotic interference including forest fires, unauthorized mining, etc.

3.3 Interventions Proposed and Methodologies

3.3.1 Forest Protection

With regular increase in population and anti-social activities, the pressure on forest is also increasing. To reduce the rate of theft in the forest area intensive patrolling in the forest area is required, so that forest offenders can be apprehended. For constant patrolling in the forest each forest sub-division is taken as a unit. There are 74 forest sub-divisions. Each sub-division is proposed to be given one four wheeled vehicle. However, less than half of the sub divisional forest officers already have the vehicle in relatively proper condition. Thus only 54 new vehicles (Gypsies) are proposed to be purchased to effectively tour the area to curb / minimize the forest offences. These relatively less proper conditioned Gypsies would be transferred to the Range Officers whose territory is comparatively much smaller, consequently these old vehicle could be put to optimum use in patrolling the forest areas.

Besides the 54 Gypsies for field S.D.Os., five vehicles (Cars) are also proposed to be purchased for C.C.Fs. and other senior level officers who are presently finding it difficult to extensively tour the far-flunged areas in old vehicles. The initial and recurring costs for five years towards these vehicles has been put in the tabular form in the Annexure-I The recurring costs include expanses toward PoL, maintenance and drivers' wages. These vehicles will be very useful

in approaching the remote area without losing much time to help get hold of forest offenders. The continuous supervision will increase and thus there would be effective control on forest offences.

3.3.2 Fire Protection

A long track of fire lines need to be created to prevent fire in the forest. The protection staff also needs to be equipped with fire protection equipments. There is a need to erect watchtowers in the remote areas with a room for protection staff. Ten watch towers need to be built in each forest division. The fire fighting equipments will be purchased and fire line will be maintained in subsequent year. The protection control room will be upgraded by providing computers, software's and vehicles.

Besides fire line & control room up gradation there is urgent & purposeful need of fire fighting laborers for prevention and control of forest fires during the fire season. A team of five fire laborers at each of the 786 Range Assistant levels are being proposed for 4 fire months in a year.

3.3.3 E-POR System

A total of 7759 Personal Digital Assistance (PDA), meant for E-POR technology are proposed to be provided down to forest guard level, so that the field offences could be transferred to H.Q. via internet within a fraction of time, to enable mobile security support, if required. It will also help quick compilation of POR cases. Such a move would also reduce pilferage, if any.

3.4 Financial implications for the components

- Total 5 year financial outlay: Rs. 8736.02 Lakhs
- Year wise Action Plan for the project period for 5 years commencing from the year 2009-10 till 2013-14 is given in the Annexure. - 1

CHAPTER-IV

DEVELOPMENT OF PROTECTED AREAS AND BIO-DIVERSITY CONSERVATION

4. Introduction

Biogeographically, the State falls in Deccan bio-region comprising representative fauna of central India like the tiger (*Panthera tigris*), Leopard (*Panthera pardus*), Gaur (*Bos gaurus*), Sambhar (*Cervus unicolor*), Chital (*Axis axis*), Nilgai (*Boselaphus tragocamelus*) and Wild Boar (*Sus scrofa*). The State is a proud possessor of rare wildlife like the Wild Buffalo (*Bubalus bubalis*) and Hill Myna (*Gracula religiosa*), which have been declared as the state animal and bird respectively. Since last 20 years Wild Elephants have migrated in the State from Jharkhand & Orissa. An per 2007 census there are 122 elephants in the State. State Government has proposed a core area of 1110 sq. km. of Tamor Pingla Sanctuary in Sarguja District, Badalkhol Sanctuary in Jaspur District and Lemru Range in Korba District of the State for Elephant Reserve.

The State has extremely rich biodiversity. For conservation of biodiversity the State has established a representative network of protected areas including a biosphere reserve. There are 3 National Parks and 11 Sanctuaries in the State. Total forest area under protected area network including Tiger Reserve is 8022.98 sq.km, which is 5.82% of the geographical area of the State. At present Indravati Tiger project spread over Indravati National Park is the only Tiger reserve in the State. Govt. of India has given their assent for notification of Achankmar, Sitanadi & Udanti Forests has notified Achankmar-Amarkantak Biosphere Reserve. Major portion of this biosphere reserve falls in Bilaspur District of Chhattisgarh State.

Vast Biodiversity available in the State needs immediate & multi pronged action to protect, conserve and develop it for perpetuity. Lot of inputs are required for protection, conservation and development of wildlife & biodiversity in the state.

4.1. Objective of proposed plan under CAMPA funds

Main objectives of the project proposals are :-

- Sustainable development of wildlife habitat through effective protected Area management.
- Upgradation of skills of Forest Staff as well as villagers living inside and in vicinity of PAs, for better understanding of wild life management and Biodiversity.
- Eco-development in Villages dependent on PAs. To reduce their dependence on forests thus reducing Biotic pressure.
- Encourage Eco-tourism as well as develop zoological parks to increase general awareness about wildlife conservation among common public specially children.

4.2 Project Proposal

Developmental activities and initiatives for Biodiversity Conservation are proposed to be taken up in protected Area and other wildlife rich areas under following heads:-

- I. Infrastructure development
- II. Improvement of habitat
- III. Upgrading Protection Mechanism
- IV. Introducing modern Equipment for Wildlife Management
- V. Eco-tourism
- VI. Wildlife training and skill development
- VII. Upgradation of zoological parks

- VIII. Creation of Animal-rescue Squad
- IX. Eco-development in villages inside and around the PA's
- X. Study of Biodiversity in PA's
- XI. Implementation of Chhattisgarh Biodiversity State Action Plan
- XII. Awareness programme
- XIII. Conservation of Wild Buffalo
- XIV. Revision of Management Plans of PA's

4.3 Details of the Project

I Infrastructure Development

Infrastructure in most of the PA's is inadequate for effective protection and management of the areas. The objective of this component is to increase accessibility, improve communication, improving water availability, strengthening protection and educational purpose.

II Improvement of Habitat

Degradation of habitat is the major factor in dwindling population of wildlife. Improvement in habitat would not only help improve the health of existing population but will also create conducive environment for their growth in number.

III Upgradation of Protection Mechanism

Controlling poaching is the biggest challenge before the department. At present the protection mechanism lacks mobility and communication facilities. Following steps are proposed:

- (i) Establishment of Anti poaching squads at State level and in all PAs
- (ii) Providing patrolling Vehicles for all Game Rangers
- (iii) Handsets to all Beat/Game guards for communication
- (iv) Construction of barriers and barrier huts at vulnerable points
- (v) Establishment of patrolling camps in all PAs
- (vi) Clear demarcation of PA boundaries by masonry pillars
- (vii) Construction of watch towers

IV Introduction of Modern Equipment for Wildlife Management

Management of PAs and census of wildlife has become a very sensitive issue. Wildlife is facing many fold dangers from organized poaching and illegal trafficking in wildlife products. At present wildlife staff is ill equipped for carrying out effectively the duties assigned to them. Hence it is proposed to equip the staff with modern equipment for effective protection & management of available wildlife and biodiversity.

V Eco-tourism

With 44% of the State area under forests, eco-tourism can become the backbone of Tourism in the State. Eco-tourism is ecologically sustainable tourism, where the impact on eco system is minimum. Eco-tourism is a very effective means to reduce man & animal conflict and highlight the cultural heritage of local inhabitants. This can make wild animals wilderness and villagers interdependent for their sustainable survival.

VI Wildlife Training and Skill Development

At present there is no training institute / school in the State, where staff as well as villagers who are working with the department could be trained on various aspects of wildlife management. The task of wildlife management being very specific requires developing a well-equipped wildlife training institute in the State urgently.

VII Upgradation of Zoological Parks

Zoological parks are very effective tools to disseminate information about habit and habitats of wild animal. They work as entertainment center as well as information hubs.

There are two mini-zoological parks in the State namely Kanan Pendari in Bilaspur and Nandan Van in Raipur. Kanan Pendari has ample space and scope for developing into a full-fledged zoo. It is proposed to develop Kanan Pendari into a state level zoo in next 5 years. Mean while essential facility will be developed in Nandan Van mini zoo.

VIII Creation of Animal Rescue Squad

Sometime wild animals stray into the urban areas and villages situated in the periphery of forest. These wild animals need to be rescued and rehabilitated in the wilderness by a team. There is, however, shortage of vehicles and equipments required for rescue teams. It is therefore, proposed to create a Animal Rescue Squad at each district headquarters, which would be under the control of DFO. It can be immediately sent to the spot of operation.

IX Eco-development of villages inside and around the PAs

The major hindrance in the management of PAs is the biotic pressure largely caused by the dependence of villagers on forests. Demarcation of an area as PA is not sufficient to wean away people from deriving usufructs from the forest.

Their activities not only disturb the habitat of wildlife but also deplete its natural resources causing irreparable damage to fauna and flora. It is, therefore very important to reduce the dependence of inhabitants of such area on forests.

X Study of Biodiversity in PAs

At present we lack in documetation of Biodiversity available in PAs and knowledge of their threat status. It is therefore, proposed to carry out detailed biodiversity status survey in PAs taking the help of BSI / ZSI. It is proposed to earmark Rs. 140.00 lakhs for this purpose (Rs. 10 lakh for each PA).

XI Implementation of Chhattisgarh Biodiversity State Action Plan

An amount of Rs. 500.00 lakhs is proposed for implementation of Chhattisgarh Biodiversity State Action Plan.

XII Reducing man-animal conflict

1. Awareness Programme

Of late the concept of JFM has brought villagers close to the understanding of forest management. However, wild animal may be because of fear sychosis, remains more an enemy rather than an entity, which really needs their support and sympathy. It is therefore, proposed to equip the administrative units in the PAs with a mobile publicity van which would visit the villages around PAs to educate them on importance of wildlife conservation actions required to be taken.

2. Erection of Electric Fencing

Electric fencing will be erected in around villages where damage to crops by wild animals is large and frequent. An amount of Rs. 25 lakhs per PA is proposed for this work. A total amount of Rs. 350 Lakhs will be needed in the next 5 years.

XIII Conservation of Wild Buffalo

An amount of Rs. 100 lakhs is proposed for implementation of Buffalo Conservation Action Plan.

XIV Revision of Management Plans of PAs

An amount of Rs. 200 lakhs is proposed for Revision of Management Plans of all PAs with the help of wildlife experts / Consultants

XV Protection of Wildlife out side Protected Area

An amount of Rs. 1656.36 lakhs is proposed for management and protection of wildlife of the State out side the Protected Areas.

4.4 Financial implications for the Components

- Total 5 year financial outlay: Rs.14986.70 Lakhs
- Year wise Action plan for the project period for 5 years commencing from the year 2009-10 till 2013-14 is given in the Annexure - 1

CHAPTER-V

WORKING PLAN & INFORMATION TECHNOLOGY IN FOREST MANAGEMENT PRACTICES, CAPACITY BUILDING

5. Background

Forest management is the art and science of managing forest and deciding how forests provide the values, goods and services desired by society. In the sense of controlling, forest management is concerned with the application of a diverse array of specific operations to satisfy the goals and objectives established by decision makers. Information technology leverages decision processes such as data acquisition, representation, interpretation, storage, processing and sharing of information. Advances in information technology including cutting edge technologies such as Geographical Information System, Remote Sensing, Geographical Positioning System, internet, etc have impacted significantly on information management in the field of natural resource at enterprise level.

Considered in this context, information technology has a very important role to play in forest management practices in Chhattisgarh. With the use of information technology along with modern tools, it is proposed to create an IT infrastructure commensurate to the goals of the forest department at every field unit. A comprehensive geo-spatial database is also required to be developed with the use of state of art technologies. The geo-spatial database of all forest areas including diverted forest lands needs to be created and maintained in the department at various levels. Therefore, it is proposed to create geo-spatial database of all the forestlands diverted for various purposes since 1980, district-, division-, range-, beat- and compartment wise. Like wise it is also proposed to create database of all the non-forest lands taken over by the forest department towards compensatory afforestation. Application softwares which will work at enterprise level is also required to be developed. For better and speedier communication, network and intranet application also needs to be developed. It is also proposed to develop and provide a decision support system (DSS) for arriving at the proper decisions in planning as well as execution of the various projects on sound and scientific principles, for the various activities to be taken up by the department under various projects. In order to accomplish the aforesaid tasks, it is proposed to develop and strengthen existing institutions. It is imperative to strengthen the present FMIS Division at Raipur and rename it as Center for Forest Information System and develop the six regional Geomatics Centers at each forest Circle, one Forest Land Record Center and a Forest Data Center at Raipur with the funds available under the Net Present Value (NPV).

5.1 Objectives

- 1) To prepare a comprehensive geospatial database for accurate and speedier management of natural resources. For this, state of art technologies such as Decision Support System, Remote Sensing (RS), Geographical Information System (GIS), Global Positioning System ((GPS) and internet will be used
- 2) To create geospatial database of all the forestlands diverted for various purposes since 1980, district-, division-, range-, beat- and compartment wise

- 3) To create geospatial database of non-forestlands taken over from various user agencies for the purpose of compensatory afforestation since 1980. and to prepare geo-spatial database of the area under compensatory afforestation since 1980
- 4) To build and enhance the information technology and communication infrastructure and technical capabilities of the forest officers in geomatics and information
- 5) To establish a intradepartmental network and develop a user friendly enterprise level dynamic intranet portal for data communication, data mining and dissemination of information to public at large

5.2 Methodology

To achieve the above objectives, following will be the methodologies:

1. The Center for Forest Information System (CFIS) will act as the Nodal Agency and create geospatial data bases by out sourcing the task to professional organizations having experience in this kind of work, following the due procedures.
2. The Center for Forest Information System (CFIS) along with six regional geomatics Center will carry out the task of technology based analysis for change detection of vegetation at different levels, vegetation classification and mapping and monitoring in house.
3. The six regional Geomatics Centres will provide training and other inputs for capacity building of the field officers. When ever necessary the CFIS will also provide necessary trainings, in liaison with national organizations like Survey of India, FSI Dehradun, IIRS Dehradun, and NRSA Hyderabad for building the capacities of the Officers and staff of the Department in the Geo-Information Technology.
4. Offices up to Range level will be provided computers and an intranet shall be in operation with broadband leased lines.
5. There will be forest land record Center for forest land data management and state forest data Center for continuous updation of data for the intranet.

5.3 Activities Proposed

1. Infrastructure Development & Maintenance:

1. Upgradation of Computers & other Auxiliary Infrastructures in FDHQ: At present there are about 35 computers in the FD HQ, Raipur. All such computers have been provided to Officers and their stenos. Now computers have to be provided to different sections in different wings. Therefore about 50 computers have to be provided to different sections in the head office. Beside this, few computers provided to Officers /stenos need to be upgraded to higher version.
2. Up-gradation of FMIS Division into CFIS with trained manpower: FMIS Division will be upgraded to a Center for Forest Information System (CFIS). This institution shall have the overarching function in the State so far the IT is concerned. This proposed Center shall function as development Center with R&D capability. Presently FMIS Division has about 30 computers, half of which need to be upgraded to higher version. Beside this GIS / remote sensing and system softwares have to be added to the present fleet of softwares. More trained manpower will be added to the present working strength.
3. State Forest Data Center, Raipur: Operation of departmental intranet shall require continuous data entry, updation, storage and data retrieval. This will make data updation a continuous process. In order to accomplish this, there is a need of setting up

- of a State Forest Data Center either in FDHQ or in other place in Raipur. This Center shall have about 12 computer operators and two programmers and one system analyst.
4. Geomatics Centers at six Circle HQ: There will be six regional geomatics Centers in each Circle headquarter to cater the geomatic need f the field units.
 5. Working Plan CF office at Durg and Upgradation of WP divisions with Survey & Mapping Technology and manpower: Presently, there is only one working plan Circle at Bilaspur. Looking at the geographical and forest area of the state, it is proposed to have one more working plan Circle at Durg. Beside this, all eight working plan Divisions will be equipped with latest survey and mapping technology such as total station, Mobile Mapper, Computer, GIS and GPS.
 6. Vehicles for CFIS and WP Divisions: In order to conduct ground truthing at the field, the proposed CFIS needs two vehicles. Beside four vehicles are also required for CF and Working Plan Officer for inspection and ground truthing. Therefore, vehicles required shall be taken on rental basis.
 7. Video conferencing between FDHQ & Six Circles HQ: It is proposed to establish studios at each Circle office and one at PCCF office so that video conferencing of Conservators and DFOs can be done. This is required for speedy monitoring of forestry programmes.
 8. Computers and accessories in Circles, Divn, sub-Divn , Ranges and trained manpower: At present each forest Division has one or two computers doing the office typing work. This set up shall be improved to make the office more productive. Therefore, it is proposed to provide three computers for each Circle and Division office and one computer to sub-Division and Range office.
 9. Forest Land Record Center, Raipur: Fourty four percent of geographical area of the State is under forest. Records of this huge land mass need to be organised, managed, updated on a continuous basis. At present there is no set up in the department to maintain the forest land records. Therefore, it is proposed to set up a Forest Land Record Center equipped with latest information technology for managing record.

2. Database Development

- Digital Data (Topographical) Procurement from SOI: Out of 200 SOI (1: 50,000) sheets, about half of the digital data has been already procured from SOI, Dehradun. The remaining half shall be procured from them.
- Geo-spatial Database Development and Updation (Other than SOI data): Forest database of the State shall be developed fully and updated. Survey and collection of attribute data pertaining to boundary pillars and other forest attributes using Real time Global Positioning System / DGPS will be undertaken. This will include all the compensatory afforestation / plantations; surveying the assets of forestlands such as nurseries, other than compensatory afforestation areas, plantations, water harvesting structures (WHS), fire-lines, fire-watch towers, timber / Bamboo depots, forest rest houses / inspection huts , saw mills and forest based industries, wireless stations, forest check-posts.
- Survey and mapping of forestry lands (diverted for non-forestry purposes), all non-forestry lands acquired for compensatory afforestation purposes, all compensatory afforestation plantation.
- Revision of topographical data with the help Survey of India and other Government t agencies: The SOI topo-sheets are very old. These need to be updated with resurvey at the field level as well as the use of satellite imageries and ground truthing.

3. Forest Mapping & Map Production

- Vegetation Classification and Vegetation Cover Change Monitoring: Classification of forest vegetation based on current satellite imageries and monitoring of forest density change shall be done.
- Preparation of Water Harvesting Structures Maps: Water harvesting structure maps will be prepared for each Division for intensive watershed management in the State. Therefore, site suitability maps will be prepared for water harvesting structures, duly adding additional inputs like soil, geomorphology and aquifer layers.
- Development and Updation of Fire Risk Zone maps
- Map Printing: Stock, Management Map and Beat / Range Map

4. Software Development & WP Data Processing

- Application Development and revision of WP DSS and Development and maintenance of Web GIS. Application development is continues process. This is required for improving the software version and make it more relevant to the changing needs.
- DSS, Production DSS, Plantation DSS, JFM DSS, Protection DSS: It is also required to develop a sound Decision Support System using modem technology tools like Remote Sensing (RS), Geographical Information System (GIS) and Global Positioning System (GPS).
- Intranet development for inter-departmental data communication
- Data processing – Inventory, Comp data, Production data, etc.

5. Computer Networking & Communication (Intranet Programme)

The objective of networking is to create a platform through which departmental data shall be communicated. For this, in the first phase, first preference shall be the BSNL's Broadband services (DataOne). This facility is available in 10 cities of Chattisgarh. In such ten cities, the department has about 30 forest offices (8 Circle offices + 22 Division offices). These offices / locations shall be connected to the network by Broadband. The rest 22 locations where our forest Divisions are situated need to be connected to the departmental network through managed leased line offered by BSNL. In the second phase, all sub-Division and Range offices shall be networked with the use of lease line.

- LAN Upgradation in FDHQ & FMIS Division
- LAN in CF, Division office
- Establishing Web-Server in CFIS and On-line Operation
- Wide Area Networking of Ranges, Sub-divn Division, Circles

6. Training & Capacity Building

- Geo-information training to Senior Officers at different Centers of Excellences
- GIS / RS Training to officers /staffs at CFIS

- GIS / GPS Training to range officers and below at regional geomantic centers
- GIS / RS & Computer Training for trainees at Forest schools
- Training of Ministerial staffs in Computer and intranet operation
- Training of Officers / staffs of CFIS in advanced software / DSS development.

7. Project management & monitoring

Any project needs to be managed very efficiently and sincerely so that the results of the project can be seen on the working of the department. Therefore, it requires administrative expenditure for efficient monitoring and evaluation on a continuous basis.

5.4 Expected Results

With the use of geo-information technology, a reliable and accurate and comprehensive database will be created which will be the backbone of a forest management in the State. It will also be highly useful for planning, execution, monitoring and evaluation of different forestry activities and programme. The survey maps prepared with the use of GPS / DGPS, the classified vegetation maps for monitoring forest cover, the change detection maps, the fire risk zonation maps and site suitability maps for different activities will help the ground level officers to take appropriate decision which will be based on scientific criteria, analysis and free from bias. This will result in cost effectiveness of planning, implementation, and monitoring at the same time ensuring transparency and increased efficiency.

Another expected results would be intensive computerization of the department. With the use of intranet, the data communication, storage, processing, retrieval and reporting will improve. This will make the department more efficient and productive. With the increasing use of intranet, initially at each forest division level and then range level, monitoring and evaluation of all the components of forestry will be very efficient. The monitoring and the evaluation will be continuous and will commence from the beginning of the activities. It will be monitored on monthly, quarterly and yearly basis. The components, which will be focused upon, are working plan, plantation, production, land management, protection, assembly question monitoring, complaint monitoring, protected area management, social forestry, research and development and human resource development etc.

5.5. Financial Implications

Year wise Action Plan for the project period for 5 years commencing from the year 2009-10 till 2013-14 is given in the Annexure-I.

6. Financial implications for the components

- Total 5 year financial outlay: Rs. 11805.00 Lakhs
- Year wise Action Plan for the project period for 5 years commencing from the year 2009-10 till 2013-14 is given in the Annexure. - 1

CHAPTER-VI

INFRASTRUCTURE DEVELOPMENT AND STAFF AMENITIES

6. Introduction

The Government of Chhattisgarh has been implementing various programmes and schemes relating to the forest development as per the National Forest Policy. However, forestry sector traditionally suffers from inadequate budgetary support. The sector was once treated as Revenue earning department. But, with the depletion of forest, there is growing concern for conservation and preservation of existing forests. Many a times this concern is not always matched by the budgetary support for the sector due to priorities of the governments and their ways and means position. Invariably, even though the budget may be available for carrying out forestry developmental activities but there is hardly any financial support for infrastructure development of the department. It is felt that sufficient and adequate infrastructure is essential for implementing various forestry developmental activities successfully.

6.1. Objectives

- a) Improve communication
- b) Improve mobility
- c) Improve office support
- d) Improve office accommodation at various levels of staff
- e) Improve residential accommodation at various levels of staff.
- f) Improve technical support in terms of proper equipments etc.
- g) Provide support in the form of health, education facilities and temporary accommodation for the dependants of the staff posted in remote and interior areas.

6.2. Proposed Activities

In order to meet the above objectives following activities are proposed to be taken up for improving the infrastructure:-

(I) Up gradation of Forest Rest Houses

Forest rest houses are constructed and maintained for catering the needs of forest officers touring and inspecting the forest and forestry operations. In recent times these rest houses have become too handy for public representatives and officials of other deptts. In turn these rest houses work as facilitation centers for both the public and public representatives and officials. There are about 350 forest rest houses, most of them situated in the midst of forests. These rest houses cater to the needs of eco-tourists also. But due to lack of proper budgetary provisions, the upkeep of these rest houses have suffered a lot. There is a strong need for renovating and upkeeping of these forest rest houses because many of them are as old as 50 years or more. The fund requirement may be very high for this work but looking to the funds available a project for Rs. 50 crore is submitted here with.

(II) Up gradation and Renovation of Field Staff Residences

The forest officials regarding Forest Guard, Range Assistant and Range Officers reside deep in side the forest. Most of the residences of Forest Guards and Range Assistants

lack proper toilets, drinking water facilities and electrification. There are 8000 building including 920 Range Assistant, 3000 Forest Guard and 1800 other officials houses in the State. It is proposed to construct toilets along with soaking pits in 4000 residences with each costing Rs. 25000/-. Drinking water facility will be given second priority. It is proposed to construct raised tank with tube wells and pipe line in forest colonies, where lower forest functionaries are residing in group. Approximately 300 such tanks will be constructed each costing about Rs. 3 lakh. There are Forest Guard / Range Assistant quarters situated in far flung areas and little away from the habitation. It is proposed to provide hand pumps at such places. It is proposed to have 1000 such hand pumps with each costing 0.70 lakh. There is either no electrification or improper electrification fittings in large no. of Forest Guard / Range Assistant and other official's quarters. It is proposed to have electrification in 5000 such buildings with each costing Rs. 30000/-. Most of the subordinate staff buildings / forest colonies in the field are with no boundary wall having no sanctity of premises. Such areas are prone for encroachments and thefts. It is proposed to have boundary walls at 500 such places with each costing Rs. 1.00 lakh. Many of the buildings have tiles roof which requires a lot of maintenance and creates hardship particularly during the rainy season. It is proposed to renovate such 2000 buildings with an average cost of Rs. 35000/- with trusses and asbestos sheet. About 300 other buildings having tiles roofs/ asbestos sheet shall be converted into concrete roof each costing Rs. 2 lakh.

In addition to these basic activities, being taken up to improve the living standard of employees, other incidental and special repairing if any will also be taken up under this head.

6.3 Financial implications for the Components

- Total 5 year financial outlay: Rs. 11000 Lakhs
- Year wise Action Plan for the project period for 5 years commencing from the year 2009-10 till 2013-14 is given in the Annexure. - 1

CHAPTER-VII

7. FORESTRY RESEARCH & EXTENSION IN CHHATTISGARH

Newly created Chhattisgarh State has 44% forests of its geographical area. To provide technical facilities for promotion and encouraging forestry in private sector three Research and Extension Divisions have been established in the State. These Centers are executing important job of quality seed and seedling production, collection, storage and distribution besides other works.

High-tech Nurseries have been established to produce quality seedlings in these Research & Extension Divisions. Quality seed is an important aspect for production of quality seedlings. To achieve the objective of production of quality seeds, Seed Production Areas of important species viz Teak, Eucalyptus, Khamer, Aonla, Saja, Sisam, Bija, Dhawada etc which have more demand in private sector have been developed in 514.76 ha. in natural forests under these Research & Extension Divisions. However, quality seeds can be obtained from seed orchards. Accordingly, Seedling Seed Orchards in 193 ha. and Clonal Seed Orchards in 184.5 ha. have been developed for important species. One tissue culture lab has been established at Raipur and two labs at Bilaspur and Jagdalpur are being established for the production of genetically superior planting stock of important and difficult species from grant of 12th Finance Commission.

Tribal dominated State Chhattisgarh consists of 50 % villages located in 5 Km. radius of forest boundaries. Major population of these villages are tribals who are very poor and almost dependent on forests. However the population other than tribal are also equally dependent on forests. Thus forests have countable role in the development of Chhattisgarh economy. This provides great opportunity for forestry research. To achieve the objectives of conservation and development of State forests and capacity building of implementation functionaries, a state level Forest Research & Training Institute is being established at Raipur. Building design has been finalized and Chhattisgarh State Housing Board has started construction work. Total cost of this project of building construction has been estimated at Rs. 3000 lakhs. At present Rs. 375 lakhs have been provided by the Government of Chhattisgarh. Two wings i.e. Forestry Research and Training will be the major constituents of this Institute.

7.1 Justification of Research and Extension Activities

- 1. Establishment of High-Tech Nursery** - High-tech Nursery will be established in all 32 Divisions with complete structure of Agro-shade net house for hardening of plants, Poly Globules, Root Trainers, etc. Clonal plants and Seeds will be sold from these nurseries.
- 2. Strengthening of Existing High-tech Nursery** - Existing three nurseries will be strengthened by the extension of existing nursery infrastructure, renovation of old Mist Chamber, Hardening Chamber, Poly Globules, Root Trainer, Hyko-trays, Culling Orchard for important species to collect juvenile buds, Branch and stem cutting etc. will be established. Establishment of new Vermicompost units, Clonal testing area (CTA) etc will be taken up. It will give us superior quality plating stock for plantation and experimental purposes.
- 3. Strengthening of Existing Tissue Culture Laboratory** - Strengthening of existing Tissue Culture Laboratory for mass propagation of superior planting stocks will be

taken up. **Capacity of labs would be increased and new technology will be introduced.**

- 4. Establishment of Botanical Garden** - In the State, Botanical Gardens will be established

in each District which will serve the needs of people.

- 5. Establishment of State Forest Research and Training Institute** - A State level Institute of Forestry Research & Training is being established in the capital of State to play the role in the development of forests and people of the State.

7.2 Financial implications for the components

- Total 5 year financial outlay: Rs. 3000 Lakhs
- Year wise Action Plan for the project period for 5 years commencing from the year 2009-10 till 2013-14 is given in the Annexure - 1.

CHAPTER-VIII

DEVELOPMENT OF MEDICINAL PLANTS

8 Concept of Project

As we know that cultivation of medicinal plants are not easy for farmers and tribal. It would be better to advise them to jump in this field, one has to set a model of its cultivation, and develop easily accessible information dissemination and marketing system. SMPB, through this project wants to develop such a unique model of cultivation, processing and marketing network for sustainability of this activity at for the state and the country.

The proposed Model is a unique feature designed for the first time by Forest Department constitutes six fundamental components i.e. herbal garden, multi-storey intercropping, drip irrigation, vermi-compost, bio-fungicide and bio-insecticide, all to be covered at the one place. The establishment of herbal garden includes more than 300 medicinal plants which will be selected based on the pre-determined indicators of agro-climatic suitability, market demand, natural distribution etc. The proposed multistorey model will provide adequate land to be taken up under intercropping so that the land may be efficiently utilized during the growing years of the main tree species. Subsequently, these intercrops, which include medicinal, provide immediate and additional income to the department from the first year itself. Besides, most of the crops selected for promotion under intercropping have the capacity for low cost multiplication and replication so that once planted, they continue to benefit the department for nearly four or more years. Thus, while the main crop grows to a producing stage, the intercrops provide necessary sustenance to the department and also enable continued income to the department from the same land.

In order to promote the technical know-how among the growers, intensive and extensive extension programme will be implemented in the ten Districts of Chhattisgarh. For publicity GO's & NGO's will be involved to impart trainings in various stages of cultivation, maintenance, insect and pest management, pre and post harvest management, processing, storage, marketing, value addition etc., through published literature, meetings, lectures, educational and documentary films etc., thus adopting an end-to-end approach of integrating the entire process, right from the stage of production till it reaches the consumption stage.

8.1 Objectives of the Project

- i. To create awareness about employment potential in medicinal plant cultivation.
- ii. To establish model herbal production plot (High-tech plot) based on mixed multi-storey cropping pattern with use of operationally proven technology of medicinal plant cultivation in C.G. region.
- iii. To implement location and species specific pilot project as production model on sustainable and commercial basis in order to disseminate findings about new and appropriate technologies.
- iv. To establish processing centre for value addition of herbs.
- v. To organize training courses to facilitate the dissemination of improved technology and management techniques to the rural and urban masses.
- vi. To develop skilled human resource for medicinal plant cultivation, processing and marketing in the State.

8.2 Strategy for Implementation of Project

There will be four distinct parts of project strategy, which are as under:

1. Cultivation of medicinal plants on Demonstration plots
2. Production of QPM
3. Awareness and promotional activities
4. Processing and value addition activity.

8.3 Financial implications for the components

- Total 5 year financial outlay: Rs. 2000 Lakhs
- Year wise Action Plan for the project period for 5 years commencing from the year 2009-10 till 2013-14 is given in the Annexure - 1

CHAPTER - IX

PROPOSAL TO ESTABLISH NTFP PROCESSING UNITS

9. People and Forests

Chhattisgarh State with 44 percent Geographical area under forest cover is very rich in NTFP resources. Traditionally tribals and other forest fringe dwellers are dependent on the forest to meet their sustenance needs through generations. They have Indigenous Technical Knowledge (ITK) for harvesting and semi processing of various NTFPs, which are sold mostly at the local market at a non-competitive rate for their livelihood.

9.1 Opportunities

They have ample natural capital, ITK for utilization of the forest resources and an open market with high demand for various NTFPs.

They could get an incremental return with processing and value addition of the products in the open market.

9.2 Challenges

Transfer of modern user-friendly technology and blend it with the ITK of the people for skill up gradation, quality assurance and brand making of the products for value addition and bargaining capacity to have control over the open market system to expand their livelihood opportunities.

9.3 Intervention Strategy

Creation of livelihood opportunities based on non-destructive harvesting and utilization of locally available Medicinal, Aromatic and Dye Plants (MADPs) through introduction of simple, user friendly technology.

To check the flow of MADPs in raw form to the market, 35 NTFP based processing and value addition units for processing and value addition of the MADPs @ Rs. 60 lakh each are proposed to be established in the State through community participation. This will require an amount of Rs. 2100 lakhs which may be supplemented from CAMPA funds.