



GOVT OF MAHARASHTRA

WORKING PLAN

FOR

PUSAD FOREST DIVISION YAVATMAL FOREST CIRCLE

FOR THE PERIOD 2008-2009 TO 2017-2018

VOLUME-I

BY

DR. DINESH KUMAR TYAGI, I.F.S.

AND

**G.RAMA KRISHNA RAO, I.F.S.
CONSERVATOR OF FORESTS
WORKING PLAN, YAVATMAL**



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PREFACE



The Working Plan of Pusad Division written by Shri.G.R.K.Rao,IFS, Conservator of Forests, Working Plan Division, Yavatmal replaces the Working Plan prepared by Shri. Vikas Gupta, IFS, Dy. Conservator of Forests, Working Plan Division, Yavatmal (1996-97 to 2005-06). The Preliminary Working Plan was prepared by Dr.D.K.Tyagi and was sanctioned by the State Level Committee in its meeting at Nagpur on 26 July 2005.

The present Plan has been prepared keeping in view the guidelines from GOI and the National Working Plan Code and after completion of all the field work related with stock mapping, enumeration and stem / stump analysis. The enumeration data was already fed in computer and analysed by Dr. Tyagi and the same was presented during the state level meeting, the remaining work has been completed by Shri. G.R.K.Rao within a short period at joining the division and the brief of enumeration analysis, stem/stump analysis is presented in the relevant chapters. All the maps including village maps have been digitized and put on the computer in electronic form. The satellite imageries for the year 2004 has been used for density slicing and comparing the data with the details of stock map analysis. The digitized maps can be used as a reference map in the future and stocking details only would now have to be updated during the next course of revision of this Plan. After the Plan is sanctioned, the coloured digital maps with details of features like roads, compartment/coupe boundaries, rivers and other water sources can be prepared, range/round/beat wise and be distributed to the field staff for ready reference, Geomedia, viewer, if supplied to the territorial staff, can be helpful in viewing as well as printing of the relevant portion of the maps on any scale as and when required by the field staff.

The present plan, in addition to putting the data and maps in electronic form, has also put emphasis on different protection strategies needed for remaining forest and wildlife wealth in the area. The efforts for meeting the local need and regulating the cattle grazing as well as enhancing the efforts for JFM have also been amply advocated at relevant places.

The present plan has also analyzed the relevance of SCI and coppice with reserve silvicultural systems with reference to the relevance to the present crop. The present plan has also stem analysis for high forest as well as coppice crops was done separately with a view to prescribe proper harvesting girths for two different kind of crops. Though separate chapter for over-wood removal has not been given, adequate provisions have been made at relevant places to ensure that the regeneration of teak is taken up in the areas which have the potential for growing large and valuable timber in the area.

Keeping in view the thrust of areas for National Working Plan Code, separate chapters have been devoted for Forest Protection, Wildlife Management and NTFP.

Shri. Rao and his entire team has done excellent work in bringing the Working Plan in the present form, which is full with details of field data and its analysis, which has been finally used to make the prescriptions very scientific and rational. The digitization has been done in-house and most of its analysis has been carried out at the divisional headquarter. The Conservator of Forests as well as his staff deserve appreciation for this kind of effort. I heartily congratulate the entire team for doing the excellent work.

I trust the field staff of Pusad Forest Division would implement the present Plan with the same spirit and sincerity with which it has been prepared. If done so, the potential forest area of Pusad forest division would regain its glory and be on the fast lane of recovery. The various operations prescribed in the Plan would generate sufficient employment for the local people. The enhanced productivity of the forest alongwith the employment which is likely to be generated from these works would definitely bring material prosperity as well as environmental health and security to the people of the area in particular and the population at large in general in the long run.

Place : Nagpur
Dated : 27th February 2007.


(Ramanuj Choudhary)
Chief Conservator of Forests,
(Working Plans), Nagpur.

INTRODUCTION



The Pusad forest division was carved out of East and West Yavatmal forest divisions with the effect of G.R.no.FDM/1880/1-F 2, Dt. 29th August 1983, resulting in the formation of 3 forest divisions i.e. Yavatmal division, Pandharkawada division and Pusad division.

The forest is a natural resource which requires long gestation period to yield the results, therefore there is a need for continuity and consistency in the management of the forests. Working plan is a scientific document which aims at consistent management and enforcing the systematic and mandatory regulations for continuous working of the forests. Working Plan is a written scheme of management aiming at continuity of policy and action and controlling the treatment of forests (BCFT). Initially the working plans in India emphasized for regulating the harvesting of timber on sustained basis. Subsequently the thrust of working plan was on protection of forest, regeneration, wild life management, needs of local people and cattle grazing regulation. In the recent past emphasis has been given on peoples participation (Joint Forest Management) in management including sharing of usufructs, biodiversity conservation, watershed management and utilization of non-wood forest produce (NWFP). In general, National Forest Policies, the nature of forest, the local conditions and the needs of people govern the objects of management.

The forests of Pusad division are mostly coppice origin with stunted and malformed growth. The site quality is, in general, IV B with some of the patches of IV A and site quality III. The natural regeneration of teak and its associates failed to establish due to heavy grazing pressure and repeated fires resulted in compact soil. The crown density of the forest varies from 0.4 to 0.6 and some of the patches fall between 0.1 to 0.4. The tract is well drained by Painganga and its two major tributaries i.e. Arunavati and Pus.

The forests of Pusad division were managed as a part of Berar and the main objects of management were to restore the forest by giving them rest and protecting against fire and grazing during the period from 1865 to 1915. A regular working plan was introduced in 1915 written by Shri. Malcolm and these forests were managed under this plan upto 1938. Two systems of management i.e. improvement fellings and coppice with standard were prescribed by Shri. Malcolm. The working cycle was 20 years and the areas were closed for 5 to 10 years after felling. Robinson's plan came into existence in 1938 and continued till 1956 with conversion system for high forest. The rotation period was 60 years for medium quality teak forest and 80 years for high quality teak forest. Agri-Silvi plantations were raised with mixed success. Fellings in conversion system were heavy, coupled with unsatisfactory regeneration. Coppice system was mostly used to manage teak forest. Thosre's plan (1955 - 1975) was introduced and the approach of Robinson's plan was continued with little modifications. Thosre's plan was replaced by Pal's plan (1976-1991) in which the Selection cum Improvement system was introduced in high forest and coppice with reserve and improvement systems were adopted for the management of other forests. Plantations and pasture development works were prescribed and the desired results were not achieved due to edaphic factors, biotic pressure and climatic conditions. In Gupta's plan emphasis was given on conversion of coppice forest into high forest and improvement felling in high forests.

In this area, enumerations were carried out in 1972, 1994 and 2004 to estimate the growing stock and regeneration and to know about the status of growing stock. The analysis of enumeration data reveals that there is substantial decrease in growing stock in 1994 as compared to 1972 data and marginal increase is noticed in 2004 vis-a-vis 1994 data. It is clear from the analysis of enumeration data conducted by the SOFR Amravati that there is overall degradation in growing stock of the forests. The growing stock of misc. species has slightly increased in 2004 as compared to the growing stock record in 1972 and 1994.

The present working plan aims at achieving the objectives of National Forest Policy 1988 . These aims and objectives are **1.** maintenance of environmental stability through protection of existing forests, **2.** biodiversity conservation, **3.** checking soil erosion and denudation in catchment areas. **4.** improvement in forest cover through plantations in understocked and unproductive areas, **5.** meeting the local demands for fuel wood, small timber and non wood forest produces, **6.** efficient utilization of forest produces, **7.** involvement of local people especially women folk in management of forest at all levels.

This plan deals with total area of 69,435.26 ha. of Pusad forest division. The main system adopted to manage the forests is SCI which covers an area of 35,709.73 ha. constituting 51.43%. 2nd major system adopted is catchment area treatment in which 17015 ha. area is included. This is followed by afforestation working circle. The area included is 12297.03 ha. Apart from above mentioned systems of treatment, other working circle are, old teak plantation management working circle (1064.81 ha.), Silvi-Pasture working circle (1680.90 ha), Misc. working circle (1667.79 ha). Additionally Non wood forest produce (overlapping) working circle, Joint Forest Management (overlapping) working circle, Wild Life conservation (overlapping), working circle and Forest protection (overlapping) working circle, are also proposed in view of National Working Plan Code.

I am extremely grateful to Shri. Jwala Prasad, I.F.S., Principal Chief Conservator of Forests, M.S. Nagpur, Shri. A.B. Bhangre, I.F.S. Addl. Principal Chief Conservator of Forests (Production and Management), M.S., Nagpur for providing valuable suggestions. I am specially thankful to Shri. Ramanuj Choudhary, I.F.S., Chief Conservator of Forests, Working Plans, Nagpur for providing able and valuable guidance along with necessary encouragement in preparing this plan in its present form. I am also thankful to Shri. Shailendra Bahadur, I.F.S. Chief Conservator (T), Yavatmal Circle for guidance and suggestions from time to time. Sincere thanks also due to Shri. Ravichandran I.F.S. the then Dy.Conservator of Forests, Pusad forest division and Shri. V.V.Gurme, I.F.S. Dy. Conservator of Forests, Pusad forest division for their help and cooperation in preparing this draft plan. I also acknowledge thanks for suggestions given by Shri.R.S.Yadav, I.F.S.

Conservator of Forests (Working Plan), Chandrapur – 2 and Shri.M.K.Rao, I.F.S., the then Conservator of Forests (Working Plan), Amravati in preparation of this plan.

I am thankful to Shri.S.G.Joshi, Clerk for the excellent job done in processing and preparation of this draft plan. I am also thankful to Shri.G.G.Dakole, Steno – Typist O/o C.C.F. (T), Yavatmal for his contribution in preparation of the draft plan.

The efforts of all the staff members made to the best of their abilities in the office of the Conservator of Forests, Working Plan, Yavatmal must be appreciated and my sincere thanks are due to all of them also. I wish to put their names on record as below.

Name	Designation	Name	Designation
1) Shri. S.S.Wankar,	R.F.O.	10) Smt. K.K.Supase,	Clerk
2) Shri.M.M.Gajbhiye,	R.F.O.	11) Shri. B.M. Dhawle,	Driver
3) Shri.G.V.Sanap,	R.F.O.	12) Shri. L.K.Upadhe,	Forest Guard
4) Shri.B.C.Madavi,	R/S	13) Shri. V.P.Khandwe,	Forest Guard
5) Shri.V.P.Joshi,	R/S	14) Shri.V.S.Ghodam	Peon
6) Shri.V.A.Masram,	Surveyor	15) Shrimati S.R.Pardhi,	Peon
7) Mrs. P.V.Pathade	Steno-Typist	16) Shri. S.S.Kakde	Forest Labour
8) Shri. M.G.Wasake	Accountant	17) Shri. S.R.Nakhate	Forest Labour
9) Shri. A.G.Deshpande	Clerk		

Place : Yavatmal
Dated : 31st January 2007


(G. RAMA KRISHNA RAO)
Conservator of Forests
Working Plan, Yavatmal

ABBREVIATIONS USED

ACF	:	Assistant Conservator of Forests
AR	:	Artificial Regeneration
Av	:	Average
b.h.	:	Breast height
CA	:	Compensatory Afforestation
C.A.I	:	Current Annual Increment
C.B.O	:	Cut Back Operation
°C	:	Degree Celsius
cm	:	Centimeter
C.W.R.	:	Coppice With Reserved
C.C.T.	:	Continuous Contour Trench
cum	:	Cubic Meter
Compt.	:	Compartment
CCF	:	Chief Conservator of Forests
CF	:	Conservator of Forests
D.C.F.	:	Deputy Conservator of Forests
Dt.	:	Date
FCA,1980	:	Forest Conservation Act, 1980
F.D.C.M.	:	Forest Development Corporation of Maharashtra
F.L.C.S.	:	Forest Labourer's Co-operative Society
F.S.	:	Felling Series
F.R.H.	:	Forest Rest house
F.Y.O.	:	First Year Operation
GDP	:	Gross Domestic Product
Govt.	:	Government
g.b.h.	:	Girth at breast height
ha	:	Hectare
hrs	:	Hours
i.e.	:	That is
Km.	:	Kilometer
Kg	:	Kilogram
m	:	Meter
MD	:	Man Day
mm	:	Millimeter
Max	:	Maximum
Min	:	Minimum
M.A.I.	:	Mean Annual Increment
M.F.P.	:	Minor Forest Produce
MRSAC	:	Maharastra Remote Sensing Application Centre
M.S.L.	:	Mean Sea Level
M.T.	:	Metric Tone
N.A.	:	Not Available
NFAC	:	National Forestry Action Programme
N.T.F.P.	:	Non Timber Forest Produce
N.R.	:	Natural Regeneration

No.	:	Number
NWAP	:	National Wildlife Action Plan
NWFP	:	Non Wood Forest Produce
PB	:	Periodic Block
P.F.	:	Protected Forest
P.P.O.	:	Pre Planting Operation
%	:	Percentage
R.F.	:	Reserved Forest
R.F.O.	:	Range Forest Officer
Rs	:	Rupees
Sq	:	Square
Sr	:	Serial
S.C.I.	:	Selection Cum Improvement
S.Y.O.	:	Second Year Operation
Temp	:	Temperature
T.Y.O.	:	Third Year Operation
W.C.	:	Working Circle
IV th Y.O.	:	Fourth Year Operation

GLOSSARY OF LOCAL NAMES

Bandhgad	:	Earthen mound
Chunkad	:	Soil with nodular pieces of limestone
Geru	:	Red Ochre or Red earth
Gairan	:	A place for herding cattle
Gaothan	:	A site kept reserved for housing
Gully	:	Channel
Jawari	:	A cultivated millet
Jewan	:	Lunch / Dinner
Jungle	:	Forest
Kacha road	:	Temporary road
Kania	:	Coarse ground grains
Kankar	:	Lime nodules
Kartik	:	October
Kharif	:	Monsoon crop
Mandav	:	A shade
Murram	:	A reddish hard soil
Naka	:	Barrier on road for checking forest produce in transit
Nala	:	A water course
Nadi	:	River
Niahali	:	Morning meal
Nistar	:	Forest produce required for bonafide agriculture or domestic purposes
Padit	:	A barren or waste land
Pansthal	:	Waterhole
Parwana	:	License
Pit	:	Jawari flour
Rabi	:	Winter crop
Ramna/Kuran	:	A grass reserved close to grazing
Regur	:	Black cotton soil
Sarbandh	:	Lines between survey number
Shikar	:	Hunting
Siw	:	Village boundary
Taluka /Tahsil	:	A revenue administrative block.
Tambodi	:	Red coloured
Utarwat	:	Sloping surface
Vilayat	:	Evotic
Walsar	:	Soil with excess of sand

**LOCAL AND BOTANICAL NAMES OF PLANTS OCCURRING IN
PUSAD FOREST DIVISION.**

A. TREES

<u>Local Name</u>	<u>Botanical Name</u>	<u>Family</u>
Achar	<i>Buchanania lanzan</i>	Anacardiaceae
Ain	<i>Terminalia alata</i>	Combretaceae
Ali/Aal/Bartondi	<i>Morinda tinctoria</i>	Rubiaceae
Amaltas/Bahawa	<i>Cassia fistula</i>	Caesalpiniaceae
Amta	<i>Bauhinia malabarica</i>	Caesalpiniaceae
Apta/Kachnar	<i>Bauhinia racemosa</i>	Caesalpiniaceae
Anoxia/Aonla	<i>Phyllanthus emblica</i>	Euphorbiaceae
Arjuna/Kahu	<i>Terminalia arjuna</i>	Combretaceae
Babul/Babool	<i>Acacia nilotica</i>	Mimoseae
Bakain / Baka neem	<i>Melia azedarach</i>	Meliaceae
Beheda	<i>Terminalia bellerica</i>	Combretaceae
Bel	<i>Aegle marmelos</i>	Rutaceae
Bhirra	<i>Chloroxylon swietenia</i>	Rutaceae
Biba/Bhilawa	<i>Semecarpus anacardium</i>	Anacardiaceae
Bija	<i>Pterocarpus marsupium</i>	Fabaceae
Bistendu	<i>Diospyros montana</i>	Ebenaceae
Bor/Ber	<i>Zizyphus mauritiana</i>	Rhamnaceae
Chandan	<i>Santalum album</i>	Santalaceae
Chichwa	<i>Albizia odoratissima</i>	Mimoseae
Chinch	<i>Tamarindus indica</i>	Caesalpiniaceae
Dahibaras	<i>Cordia macleodii</i>	Boraginaceae
Dhaman	<i>Grewia tilifolia</i>	Tiliaceae
Dhaora/Dahwada	<i>Anogeissus latifolia</i>	Combretaceae
Dhoban/Phansi	<i>Dalbergia paniculata</i>	Fabaceae
Ghoti/Ghot	<i>Zizyphus glaberrima</i>	Rhamnaceae
Haldu	<i>Adina cordifolia</i>	Rubiaceae
Hiwar	<i>Acacia leucophloea</i>	Mimoseae
Hirda/Harra	<i>Terminalia chebula</i>	Combretaceae
Jambhul/Jamun	<i>Syzygium cumini</i>	Myrtaceae
Karam.Mundi	<i>Mitragyna parviflora</i>	Rubiaceae
Karanj	<i>Pongamia pinnata</i>	Fabaceae Flacourtia
Karu(Cassia)	<i>Cassia siamea</i>	Caesalpiniaceae
Khair	<i>Acacia catechu</i>	Mimoseae
Kusum	<i>Schleichera oleosa</i>	Sapindaceae
Kawat	<i>Limonia acidissima</i>	Rutaceae
Kulu	<i>Sterculia urens</i>	Sterculiaceae
Lendia/Lenda/schena/Asah	<i>Lagerstroemia parviflora</i>	Lythraceae
Lokhandi	<i>Ixora arborea</i>	Rubiaceae
Medsing	<i>Dolichandrone falcata</i>	Bignoniaceae

Moha/Mahuwa	<i>Madhuca longifolia</i>	Sapotaceae
Mokha	<i>Schrebera swietenoides</i>	Oleaceae
Moyen/Mowai	<i>Lannea coromandelica</i>	Anacardiaceae
Neem	<i>Azadirachta indica</i>	Meliaceae
Pipal	<i>Ficus religiosa</i>	Moraceae
Rohan	<i>Soymida febrifuga</i>	Meliaceae
Sag/Sagwan/Teak	<i>Tectona grandis</i>	Verbenaceae
Saja/Ain	<i>Terminalia alata</i>	Combretaceae
Salai	<i>Boswellia serrata</i>	Burseraceae
Semal(Borgu)	<i>Bombax ceiba</i>	Bombacaceae
Shiwan/Siwan	<i>Gmelina arborea</i>	Verbenaceae
Sirus(Black)	<i>Albizia lebbek</i>	Mimoseae
Sirus(White)	<i>Albizia procera</i>	Mimoseae
Sissoo	<i>Dalbergia sissoo</i>	Fabaceae
Sitaphal	<i>Annona squamosa</i>	Annonaceae
Tendu	<i>Diospyros melanoxylon</i>	Ebenaceae
Tiwas/Tinsa	<i>Ougeinia oojeinensis</i>	Fabaceae

B. SHRUBS

<u>Local Name</u>	<u>Botanical Name</u>	<u>Family</u>
Bharati	<i>Gymnosporia spinosa</i>	Celasteraceae
Chillari	<i>Mimosa rubicaulis</i>	Mimoseae
Chillati	<i>Caesalpinia sepiaria</i>	Caesalpinaceae
Dudhi/Kalakuda	<i>Wrightia tinctoria</i>	Apocynaceae
Dhayati	<i>Woodfordia floribunda</i>	Lythraceae
Kari Korando	<i>Carissa spinarium</i>	Apocynaceae
Karat	<i>Barleria prionitis</i>	Acanthaceae
Kuda, Indrajav	<i>Holarrhena antidysenterica</i>	Apocynaceae
Muradsheng/Marorphal	<i>Helicteres isora</i>	Sterculiaceae
Nirgudi	<i>Vitex negundo</i>	Verbenaceae
Sindhi/Chhindi	<i>Phoenix sylvestris</i>	Arecaceae(Palmaceae)
Tarwar	<i>Cassia auriculata</i>	Caesalpinaceae
Waghote	<i>Capparis horrida</i>	Capparidaceae
Zingrool/Pharsa	<i>Grewia orbiculata</i>	Tiliaceae

C. HERBS

<u>Local Name</u>	<u>Botanical Name</u>	<u>Family</u>
Divali	<i>Tephrosia hamiltonii</i>	Fabaceae
Gajargawat	<i>Parthenium hysterophorus</i>	Asteraceae
Gokhru	<i>Tribulus terrestris</i>	Zygophyllaceae
Hamata	<i>Stylosanthes hamata</i>	Caesalpinaceae
Pivla Dhotra	<i>Argemone mexicana</i>	Papaveraceae

Pivili tilwan	<i>Cleome viscosa</i>	Cleomaceae
Rantulsi/Bantulsi	<i>Hyptis suaveolens</i>	Lamiaceae
Rantur	<i>Atylosia scarabaeoides</i>	Fabaceae
Scabra	<i>Stylosanthes scabra</i>	Caesalpinaceae
Tarota	<i>Cassia tora</i>	Caesalpinaceae

D. GRASSES AND BAMBOOS

<u>Local Name</u>	<u>Botanical Name</u>	<u>Family</u>
Bans/Bamboo	<i>Dendrocalamus strictus</i>	Poaceae(Gramineae)
Bhurbhusi	<i>Eragrostis tenella</i>	Poaceae
Duswa/Haryalli/Doob	<i>Cynodon dactylon</i>	Poaceae
Dongri gavat	<i>Chrysopogon montana</i>	Poaceae
Guhar, marwel	<i>Andropogon annulatus</i>	Poaceae
Kans	<i>Saccharum spontaneum</i>	Poaceae
Khas	<i>Vetiveria zizanioides</i>	Poaceae
Kodmor	<i>Apluda varia</i>	Poaceae
Kunda	<i>Ischaemum pilosum</i>	Poaceae
Kusal	<i>Heteropogon contortus</i>	Poaceae
Mushan	<i>Iseilema laxum</i>	Poaceae
Paonia	<i>Schima sulcatum</i>	Poaceae
Sabai or sum	<i>Ischaemum angustifolium</i>	Poaceae
Sheda	<i>Schima nervosum</i>	Poaceae
Tikhadi/Rusa/Rosha	<i>Cymbopogon martini</i>	Poaceae

E. CLIMBERS

<u>Local Name</u>	<u>Botanical Name</u>	<u>Family</u>
Bhuikand/Baichend	<i>Dioscorea daemona</i>	Dioscoreaceae
Chilati	<i>Acacia pennata</i>	Mimoseae
Eruni	<i>Zizyphus oenoplia</i>	Rhamnaceae
Gunchi/Gunj	<i>Abrus precatorius</i>	Papilionaceae
Khajkuri	<i>Mucuna pruriens</i>	Fabaceae
Mahulbel/Mahul	<i>Bauhinia vahlli</i>	Caesalpinaceae
Palasvel	<i>Butea superba</i>	Fabaceae
Piwarvel	<i>Combretum ovalifolium</i>	Combretaceae
Shatova/Satawari	<i>Asparagus racemosus</i>	Liliaceae
Kawavel,Dudhi(Nagvel)	<i>Cryptolepis buchanani</i>	Asclepiadaceae

COMMON AND ZOOLOGICAL NAMES OF WILD ANIMALS AND BIRDS

A. CHECK LIST OF WILD ANIMALS

<u>Common Name</u>	<u>Scientific Name</u>
Panther/Bibta (M) / Tendua(H)	<i>Panthera pardus</i>
Striped Hyena / Taras (M) / Lakkadbagha(H)	<i>Hyaena hyaena</i>
Jackal	<i>Canis aureus</i>
Indian Fox	<i>Vulpes bengalensis</i>
Jungle cat	<i>Felis chaus</i>
Black buck	<i>Antelope cervicapra</i>
Cheetal	<i>Axis axis</i>
Nilgai	<i>Boselaphus tragocamelus</i>
Wild boar	<i>Sus scrofa</i>
Sloth bear	<i>Melursus ursinus</i>
Common langur	<i>Presbytis entellus</i>
Porcupine	<i>Hystrix indica</i>
Hare	<i>Lepus nigricollis</i>

B. CHECK LIST OF WILD BIRDS

<u>Common Name</u>	<u>Scientific Name</u>
Pond Heron or Paddy bird	<i>Ardeola grayii</i>
Cattle Egret	<i>Bubulcus ibis</i>
White Breasted Waterhen	<i>Amaurornis phoenicurus</i>
Grey Partridge	<i>Francolinus pondicerianus</i>
Jungle Bush Quail	<i>Perdica asiatica</i>
Yellow Wattled Lapwing	<i>Vanellus malabaricus</i>
Rose Ringed Parakeet	<i>Psittacula krameri</i>
Blosson Headed Parakeet	<i>Psittacula cyanocephala</i>
Alexandrine Parakeet	<i>Psittacula eupatria</i>
Koel	<i>Eudynamys scolopacea</i>
Crow Pheasant (Coucal)	<i>Centropus sinensis</i>
Spotted owlet	<i>Athene brama</i>
Common Indian Night Jar	<i>Caprimulgus asiaticus</i>
White Breasted Kingfisher	<i>Halcyon smyrnensis</i>
Common Kingfisher	<i>Alcedo atthis</i>
Green Bee Eater	<i>Merops orientalis</i>
Hoopoe	<i>Upupa epops</i>
Indian Roller	<i>Coracias bengalensis</i>
Golden Backed Wood Pecker	<i>Dinopium benghalense</i>
Rufous Backed Shrike	<i>Lanius schack</i>
Golden Oriole	<i>Oriolus riolus</i>
Black Drongo	<i>Dicrurus adsimilis</i>

Brahminy Myna
Common Myna
House Crow
Jungle Crow
Small Minivet
Common Iora
Red Vented Bulbul
Common Babbler
White throated fantail
Paradise Flycatcher
Magpie Robin
Indian Robin
Gray Wagtail
Pied or White Wagtail
Grey Tit
Purple Sunbird
House Sparrow

Sturnus pagodarum
Acridotheres tristis
Corvus splendens
Corvus macorthynchos
Pericrocotus cinnamomeus
Aegithina tiphia
Pycnonotus cafer
Turdoides caudatus
Rhipidura albicollis
Terpsiphone paradisi
Copsychus saularis
Saxicoloides fulicata
Motacilla cinerea
Motacilla alba
Parus mauor
Nectarinia asiatica
Passer domesticus

INTRODUCTION



The Pusad forest division was carved out of East and West Yavatmal forest divisions with the effect of G.R.no.FDM/1880/1-F 2, Dt. 29th August 1983, resulting in the formation of 3 forest divisions i.e. Yavatmal division, Pandharkawada division and Pusad division.

The forest is a natural resource which requires long gestation period to yield the results, therefore there is a need for continuity and consistency in the management of the forests. Working plan is a scientific document which aims at consistent management and enforcing the systematic and mandatory regulations for continuous working of the forests. Working Plan is a written scheme of management aiming at continuity of policy and action and controlling the treatment of forests (BCFT). Initially the working plans in India emphasized for regulating the harvesting of timber on sustained basis. Subsequently the thrust of working plan was on protection of forest, regeneration, wild life management, needs of local people and cattle grazing regulation. In the recent past emphasis has been given on peoples participation (Joint Forest Management) in management including sharing of usufructs, biodiversity conservation, watershed management and utilization of non-wood forest produce (NWFP). In general, National Forest Policies, the nature of forest, the local conditions and the needs of people govern the objects of management.

The forests of Pusad division are mostly coppice origin with stunted and malformed growth. The site quality is, in general, IV B with some of the patches of IV A and site quality III. The natural regeneration of teak and its associates failed to establish due to heavy grazing pressure and repeated fires resulted in compact soil. The crown density of the forest varies from 0.4 to 0.6 and some of the patches fall between 0.1 to 0.4. The tract is well drained by Painganga and its two major tributaries i.e. Arunavati and Pus.

The forests of Pusad division were managed as a part of Berar and the main objects of management were to restore the forest by giving them rest and protecting against fire and grazing during the period from 1865 to 1915. A regular working plan was introduced in 1915 written by Shri. Malcolm and these forests were managed under this plan upto 1938. Two systems of management i.e. improvement fellings and coppice with standard were prescribed by Shri. Malcolm. The working cycle was 20 years and the areas were closed for 5 to 10 years after felling. Robinson's plan came into existence in 1938 and continued till 1956 with conversion system for high forest. The rotation period was 60 years for medium quality teak forest and 80 years for high quality teak forest. Agri-Silvi plantations were raised with mixed success. Fellings in conversion system were heavy, coupled with unsatisfactory regeneration. Coppice system was mostly used to manage teak forest. Thosre's plan (1955 - 1975) was introduced and the approach of Robinson's plan was continued with little modifications. Thosre's plan was replaced by Pal's plan (1976-1991) in which the Selection cum Improvement system was introduced in high forest and coppice with reserve and improvement systems were adopted for the management of other forests. Plantations and pasture development works were prescribed and the desired results were not achieved due to edaphic factors, biotic pressure and climatic conditions. In Gupta's plan emphasis was given on conversion of coppice forest into high forest and improvement felling in high forests.

In this area, enumerations were carried out in 1972, 1994 and 2004 to estimate the growing stock and regeneration and to know about the status of growing stock. The analysis of enumeration data reveals that there is substantial decrease in growing stock in 1994 as compared to 1972 data and marginal increase is noticed in 2004 vis-a-vis 1994 data. It is clear from the analysis of enumeration data conducted by the SOFR Amravati that there is overall degradation in growing stock of the forests. The growing stock of misc. species has slightly increased in 2004 as compared to the growing stock record in 1972 and 1994.

The present working plan aims at achieving the objectives of National Forest Policy 1988 . These aims and objectives are **1.** maintenance of environmental stability through protection of existing forests, **2.** biodiversity conservation, **3.** checking soil erosion and denudation in catchment areas. **4.** improvement in forest cover through plantations in understocked and unproductive areas, **5.** meeting the local demands for fuel wood, small timber and non wood forest produces, **6.** efficient utilization of forest produces, **7.** involvement of local people especially women folk in management of forest at all levels.

This plan deals with total area of 69,435.26 ha. of Pusad forest division. The main system adopted to manage the forests is SCI which covers an area of 35,709.73 ha. constituting 51.43%. 2nd major system adopted is catchment area treatment in which 17015 ha. area is included. This is followed by afforestation working circle. The area included is 12297.03 ha. Apart from above mentioned systems of treatment, other working circle are, old teak plantation management working circle (1064.81 ha.), Silvi-Pasture working circle (1680.90 ha), Misc. working circle (1667.79 ha). Additionally Non wood forest produce (overlapping) working circle, Joint Forest Management (overlapping) working circle, Wild Life conservation (overlapping), working circle and Forest protection (overlapping) working circle, are also proposed in view of National Working Plan Code.

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Place : Yavatmal
Dated : 31st January 2007


(G. RAMA KRISHNA RAO)
Conservator of Forests
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PUSAD FOREST DIVISION

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ABBREVIATIONS USED

ACF	:	Assistant Conservator of Forests
AR	:	Artificial Regeneration
Av	:	Average
b.h.	:	Breast height
CA	:	Compensatory Afforestation
C.A.I	:	Current Annual Increment
C.B.O	:	Cut Back Operation
°C	:	Degree Celsius
cm	:	Centimeter
C.W.R.	:	Coppice With Reserved
C.C.T.	:	Continuous Contour Trench
cum	:	Cubic Meter
Compt.	:	Compartment
CCF	:	Chief Conservator of Forests
CF	:	Conservator of Forests
D.C.F.	:	Deputy Conservator of Forests
Dt.	:	Date
FCA,1980	:	Forest Conservation Act, 1980
F.D.C.M.	:	Forest Development Corporation of Maharashtra
F.L.C.S.	:	Forest Labourer's Co-operative Society
F.S.	:	Felling Series
F.R.H.	:	Forest Rest house
F.Y.O.	:	First Year Operation
GDP	:	Gross Domestic Product
Govt.	:	Government
g.b.h.	:	Girth at breast height
ha	:	Hectare
hrs	:	Hours
i.e.	:	That is
Km.	:	Kilometer
Kg	:	Kilogram
m	:	Meter
MD	:	Man Day
mm	:	Millimeter
Max	:	Maximum
Min	:	Minimum
M.A.I.	:	Mean Annual Increment
M.F.P.	:	Minor Forest Produce
MRSAC	:	Maharastra Remote Sensing Application Centre
M.S.L.	:	Mean Sea Level
M.T.	:	Metric Tone
N.A.	:	Not Available
NFAC	:	National Forestry Action Programme
N.T.F.P.	:	Non Timber Forest Produce
N.R.	:	Natural Regeneration

No.	:	Number
NWAP	:	National Wildlife Action Plan
NWFP	:	Non Wood Forest Produce
PB	:	Periodic Block
P.F.	:	Protected Forest
P.P.O.	:	Pre Planting Operation
%	:	Percentage
R.F.	:	Reserved Forest
R.F.O.	:	Range Forest Officer
Rs	:	Rupees
Sq	:	Square
Sr	:	Serial
S.C.I.	:	Selection Cum Improvement
S.Y.O.	:	Second Year Operation
Temp	:	Temperature
T.Y.O.	:	Third Year Operation
W.C.	:	Working Circle
IV th Y.O.	:	Fourth Year Operation

GLOSSARY OF LOCAL NAMES

Bandhgad	:	Earthen mound
Chunkad	:	Soil with nodular pieces of limestone
Geru	:	Red Ochre or Red earth
Gairan	:	A place for herding cattle
Gaothan	:	A site kept reserved for housing
Gully	:	Channel
Jawari	:	A cultivated millet
Jewan	:	Lunch / Dinner
Jungle	:	Forest
Kacha road	:	Temporary road
Kania	:	Coarse ground grains
Kankar	:	Lime nodules
Kartik	:	October
Kharif	:	Monsoon crop
Mandav	:	A shade
Murram	:	A reddish hard soil
Naka	:	Barrier on road for checking forest produce in transit
Nala	:	A water course
Nadi	:	River
Niahali	:	Morning meal
Nistar	:	Forest produce required for bonafide agriculture or domestic purposes
Padit	:	A barren or waste land
Pansthal	:	Waterhole
Parwana	:	License
Pit	:	Jawari flour
Rabi	:	Winter crop
Ramna/Kuran	:	A grass reserved close to grazing
Regur	:	Black cotton soil
Sarbandh	:	Lines between survey number
Shikar	:	Hunting
Siw	:	Village boundary
Taluka /Tahsil	:	A revenue administrative block.
Tambodi	:	Red coloured
Utarwat	:	Sloping surface
Vilayat	:	Evotic
Walsar	:	Soil with excess of sand

**LOCAL AND BOTANICAL NAMES OF PLANTS OCCURRING IN
PUSAD FOREST DIVISION.**

A. TREES

<u>Local Name</u>	<u>Botanical Name</u>	<u>Family</u>
Achar	<i>Buchanania lanzan</i>	Anacardiaceae
Ain	<i>Terminalia alata</i>	Combretaceae
Ali/Aal/Bartondi	<i>Morinda tinctoria</i>	Rubiaceae
Amaltas/Bahawa	<i>Cassia fistula</i>	Caesalpiniaceae
Amta	<i>Bauhinia malabarica</i>	Caesalpiniaceae
Apta/Kachnar	<i>Bauhinia racemosa</i>	Caesalpiniaceae
Anoxia/Aonla	<i>Phyllanthus emblica</i>	Euphorbiaceae
Arjuna/Kahu	<i>Terminalia arjuna</i>	Combretaceae
Babul/Babool	<i>Acacia nilotica</i>	Mimoseae
Bakain / Baka neem	<i>Melia azedarach</i>	Meliaceae
Beheda	<i>Terminalia bellerica</i>	Combretaceae
Bel	<i>Aegle marmelos</i>	Rutaceae
Bhirra	<i>Chloroxylon swietenia</i>	Rutaceae
Biba/Bhilawa	<i>Semecarpus anacardium</i>	Anacardiaceae
Bija	<i>Pterocarpus marsupium</i>	Fabaceae
Bistendu	<i>Diospyros montana</i>	Ebenaceae
Bor/Ber	<i>Zizyphus mauritiana</i>	Rhamnaceae
Chandan	<i>Santalum album</i>	Santalaceae
Chichwa	<i>Albizia odoratissima</i>	Mimoseae
Chinch	<i>Tamarindus indica</i>	Caesalpiniaceae
Dahibaras	<i>Cordia macleodii</i>	Boraginaceae
Dhaman	<i>Grewia tilifolia</i>	Tiliaceae
Dhaora/Dahwada	<i>Anogeissus latifolia</i>	Combretaceae
Dhoban/Phansi	<i>Dalbergia paniculata</i>	Fabaceae
Ghoti/Ghot	<i>Zizyphus glaberrima</i>	Rhamnaceae
Haldu	<i>Adina cordifolia</i>	Rubiaceae
Hiwar	<i>Acacia leucophloea</i>	Mimoseae
Hirda/Harra	<i>Terminalia chebula</i>	Combretaceae
Jambhul/Jamun	<i>Syzygium cumini</i>	Myrtaceae
Karam.Mundi	<i>Mitragyna parviflora</i>	Rubiaceae
Karanj	<i>Pongamia pinnata</i>	Fabaceae Flacourtia
Karu(Cassia)	<i>Cassia siamea</i>	Caesalpiniaceae
Khair	<i>Acacia catechu</i>	Mimoseae
Kusum	<i>Schleichera oleosa</i>	Sapindaceae
Kawat	<i>Limonia acidissima</i>	Rutaceae
Kulu	<i>Sterculia urens</i>	Sterculiaceae
Lendia/Lenda/schena/Asah	<i>Lagerstroemia parviflora</i>	Lythraceae
Lokhandi	<i>Ixora arborea</i>	Rubiaceae
Medsing	<i>Dolichandrone falcata</i>	Bignoniaceae

Moha/Mahuwa	<i>Madhuca longifolia</i>	Sapotaceae
Mokha	<i>Schrebera swietenoides</i>	Oleaceae
Moyen/Mowai	<i>Lannea coromandelica</i>	Anacardiaceae
Neem	<i>Azadirachta indica</i>	Meliaceae
Pipal	<i>Ficus religiosa</i>	Moraceae
Rohan	<i>Soymida febrifuga</i>	Meliaceae
Sag/Sagwan/Teak	<i>Tectona grandis</i>	Verbenaceae
Saja/Ain	<i>Terminalia alata</i>	Combretaceae
Salai	<i>Boswellia serrata</i>	Burseraceae
Semal(Borgu)	<i>Bombax ceiba</i>	Bombacaceae
Shiwan/Siwan	<i>Gmelina arborea</i>	Verbenaceae
Sirus(Black)	<i>Albizia lebbek</i>	Mimoseae
Sirus(White)	<i>Albizia procera</i>	Mimoseae
Sissoo	<i>Dalbergia sissoo</i>	Fabaceae
Sitaphal	<i>Annona squamosa</i>	Annonaceae
Tendu	<i>Diospyros melanoxylon</i>	Ebenaceae
Tiwas/Tinsa	<i>Ougeinia oojeinensis</i>	Fabaceae

B. SHRUBS

<u>Local Name</u>	<u>Botanical Name</u>	<u>Family</u>
Bharati	<i>Gymnosporia spinosa</i>	Celasteraceae
Chillari	<i>Mimosa rubicaulis</i>	Mimoseae
Chillati	<i>Caesalpinia sepiaria</i>	Caesalpinaceae
Dudhi/Kalakuda	<i>Wrightia tinctoria</i>	Apocynaceae
Dhayati	<i>Woodfordia floribunda</i>	Lythraceae
Kari Korando	<i>Carissa spinarium</i>	Apocynaceae
Karat	<i>Barleria prionitis</i>	Acanthaceae
Kuda, Indrajav	<i>Holarrhena antidysenterica</i>	Apocynaceae
Muradsheng/Marorphal	<i>Helicteres isora</i>	Sterculiaceae
Nirgudi	<i>Vitex negundo</i>	Verbenaceae
Sindhi/Chhindi	<i>Phoenix sylvestris</i>	Arecaceae(Palmaceae)
Tarwar	<i>Cassia auriculata</i>	Caesalpinaceae
Waghote	<i>Capparis horrida</i>	Capparidaceae
Zingrool/Pharsa	<i>Grewia orbiculata</i>	Tiliaceae

C. HERBS

<u>Local Name</u>	<u>Botanical Name</u>	<u>Family</u>
Divali	<i>Tephrosia hamiltonii</i>	Fabaceae
Gajargawat	<i>Parthenium hysterophorus</i>	Asteraceae
Gokhru	<i>Tribulus terrestris</i>	Zygophyllaceae
Hamata	<i>Stylosanthes hamata</i>	Caesalpinaceae
Pivla Dhotra	<i>Argemone mexicana</i>	Papaveraceae

Pivili tilwan	<i>Cleome viscosa</i>	Cleomaceae
Rantulsi/Bantulsi	<i>Hyptis suaveolens</i>	Lamiaceae
Rantur	<i>Atylosia scarabaeoides</i>	Fabaceae
Scabra	<i>Stylosanthes scabra</i>	Caesalpinaceae
Tarota	<i>Cassia tora</i>	Caesalpinaceae

D. GRASSES AND BAMBOOS

<u>Local Name</u>	<u>Botanical Name</u>	<u>Family</u>
Bans/Bamboo	<i>Dendrocalamus strictus</i>	Poaceae(Gramineae)
Bhurbhusi	<i>Eragrostis tenella</i>	Poaceae
Duswa/Haryalli/Doob	<i>Cynodon dactylon</i>	Poaceae
Dongri gavat	<i>Chrysopogon montana</i>	Poaceae
Guhar, marwel	<i>Andropogon annulatus</i>	Poaceae
Kans	<i>Saccharum spontaneum</i>	Poaceae
Khas	<i>Vetiveria zizanioides</i>	Poaceae
Kodmor	<i>Apluda varia</i>	Poaceae
Kunda	<i>Ischaemum pilosum</i>	Poaceae
Kusal	<i>Heteropogon contortus</i>	Poaceae
Mushan	<i>Iseilema laxum</i>	Poaceae
Paonia	<i>Schima sulcatum</i>	Poaceae
Sabai or sum	<i>Ischaemum angustifolium</i>	Poaceae
Sheda	<i>Schima nervosum</i>	Poaceae
Tikhadi/Rusa/Rosha	<i>Cymbopogon martini</i>	Poaceae

E. CLIMBERS

<u>Local Name</u>	<u>Botanical Name</u>	<u>Family</u>
Bhuikand/Baichend	<i>Dioscorea daemona</i>	Dioscoreaceae
Chilati	<i>Acacia pennata</i>	Mimoseae
Eruni	<i>Zizyphus oenoplia</i>	Rhamnaceae
Gunchi/Gunj	<i>Abrus precatorius</i>	Papilionaceae
Khajkuri	<i>Mucuna pruriens</i>	Fabaceae
Mahulbel/Mahul	<i>Bauhinia vahlli</i>	Caesalpinaceae
Palasvel	<i>Butea superba</i>	Fabaceae
Piwarvel	<i>Combretum ovalifolium</i>	Combretaceae
Shatova/Satawari	<i>Asparagus racemosus</i>	Liliaceae
Kawavel,Dudhi(Nagvel)	<i>Cryptolepis buchanani</i>	Asclepiadaceae

COMMON AND ZOOLOGICAL NAMES OF WILD ANIMALS AND BIRDS

A. CHECK LIST OF WILD ANIMALS

<u>Common Name</u>	<u>Scientific Name</u>
Panther/Bibta (M) / Tendua(H)	<i>Panthera pardus</i>
Striped Hyena / Taras (M) / Lakkadbagha(H)	<i>Hyaena hyaena</i>
Jackal	<i>Canis aureus</i>
Indian Fox	<i>Vulpes bengalensis</i>
Jungle cat	<i>Felis chaus</i>
Black buck	<i>Antelope cervicapra</i>
Cheetal	<i>Axis axis</i>
Nilgai	<i>Boselaphus tragocamelus</i>
Wild boar	<i>Sus scrofa</i>
Sloth bear	<i>Melursus ursinus</i>
Common langur	<i>Presbytis entellus</i>
Porcupine	<i>Hystrix indica</i>
Hare	<i>Lepus nigricollis</i>

B. CHECK LIST OF WILD BIRDS

<u>Common Name</u>	<u>Scientific Name</u>
Pond Heron or Paddy bird	<i>Ardeola grayii</i>
Cattle Egret	<i>Bubulcus ibis</i>
White Breasted Waterhen	<i>Amaurornis phoenicurus</i>
Grey Partridge	<i>Francolinus pondicerianus</i>
Jungle Bush Quail	<i>Perdica asiatica</i>
Yellow Wattled Lapwing	<i>Vanellus malabaricus</i>
Rose Ringed Parakeet	<i>Psittacula krameri</i>
Blosson Headed Parakeet	<i>Psittacula cyanocephala</i>
Alexandrine Parakeet	<i>Psittacula eupatria</i>
Koel	<i>Eudynamys scolopacea</i>
Crow Pheasant (Coucal)	<i>Centropus sinensis</i>
Spotted owl	<i>Athene brama</i>
Common Indian Night Jar	<i>Caprimulgus asiaticus</i>
White Breasted Kingfisher	<i>Halcyon smyrnensis</i>
Common Kingfisher	<i>Alcedo atthis</i>
Green Bee Eater	<i>Merops orientalis</i>
Hoopoe	<i>Upupa epops</i>
Indian Roller	<i>Coracias bengalensis</i>
Golden Backed Wood Pecker	<i>Dinopium benghalense</i>
Rufous Backed Shrike	<i>Lanius schack</i>
Golden Oriole	<i>Oriolus riolus</i>
Black Drongo	<i>Dicrurus adsimilis</i>

Brahminy Myna
Common Myna
House Crow
Jungle Crow
Small Minivet
Common Iora
Red Vented Bulbul
Common Babbler
White throated fantail
Paradise Flycatcher
Magpie Robin
Indian Robin
Gray Wagtail
Pied or White Wagtail
Grey Tit
Purple Sunbird
House Sparrow

Sturnus pagodarum
Acridotheres tristis
Corvus splendens
Corvus macorthynchos
Pericrocotus cinnamomeus
Aegithina tiphia
Pycnonotus cafer
Turdoides caudatus
Rhipidura albicollis
Terpsiphone paradisi
Copsychus saularis
Saxicoloides fulicata
Motacilla cinerea
Motacilla alba
Parus mauor
Nectarinia asiatica
Passer domesticus

PART - I

SUMMARY OF FACTS ON WHICH PROPOSALS ARE BASED

Location of Pusad Forest Division



CHAPTER – I

THE TRACT DEALT WITH

SECTION I.1: NAME AND SITUATION:

I.1.1. Pusad Forest Division was carved from East Yavatmal and West Yavatmal Divisions in 1983, vide Government of Maharashtra notification no. FDM / 1Bbo-F 2/Dt. 29-08-1983. The total geographical area of the division is 4,45,840 ha and the forest area 1,12,782.92 Ha., which forms about 25.29% of the total geographical area of the division.

I.1.2. Pusad Forest division consist of the area which falls within civil territories of Digras, Pusad, Mahagaon, Umerkhed and Part of Darwha and Arni tehasils. This plan deals with the forest area of 69,435.26 ha as compared to 82,809.35 ha area of Vikas Gupta's Plan. 3389.84 ha forest area has been handed over to FDCM and 10,098.07 ha additional area has been notified as Painganga Wildlife Sanctuary. An additional area of 35.36 Ha. of forest was taken over for compensatory afforestation under Forest Conservation Act, 1980 and notified as Protected Forest (PF). 78.46 Ha area was also taken over for compensatory Afforestation purpose however, it is yet to be notified as Unclassed Forest. These areas have been included in this present Working Plan. This working plan deals with 69,435.26 Ha of forest area, out of which 68,905.35 Ha. of Reserved Forest, 451.45 ha of Protected Forest and 78.46 Ha of un-classed forests.

I.1.3. The forest area included in this Working Plan are situated both in compact blocks as well as in scattered patches. The Forests of this Division lies between longitude 77⁰-18" to 78⁰-12' East and latitude 19⁰-26" to 20⁰-15" North.

I.1.4. Boundaries :- The boundary in North of this division coincides with Darwha taluka boundary which forms Southern side of Yavatmal Forest Division. In west the boundary coincides with Washim district boundary (Washim taluka). In the South and East of the division river Painganga forms the boundary. The boundaries of the tract dealt with are

North	:	Darwha taluka of Yavatmal district
North East	:	Arni taluka of Yavatmal district

North West	:	Manora taluka of Washim district.
West	:	Washim taluka of Washim district.
South East	:	Kinwat taluka of Nanded district & Painganga river.
South West	:	Kalamanuri taluka of Hingoli district and Painganga river
South	:	Hadgaon taluka of Nanded district and Painganga river.
East	:	Kinwat taluka of Nanded district & Painganga river.

SECTION I.2: CONFIGURATION OF THE GROUND:

I.2.1. The tract as a whole belongs to the Ajanta Range with Plateau and is situated on the southern uplands of Payanghat of Berar. The entire tract is hilly and undulating with broad valleys , sloping gently towards East. Most of the area of this division lies on high plateau of an average elevation of 350 mtrs to 450 mtrs. Ajanta hill range passes through the division and having general elevation of 550 mtrs and edge of plateau facing painganga is more rugged as it has high elevation, ranges from 600 to 700 mtr msl.

SECTION I.3: GEOLOGY, ROCK AND SOIL:

I.3.1. In this forest division Archaean rocks completely covered by Puranic rocks in turn were covered by Gondwana system and Deccan trap. The action of weathering removed Deccan trap in parts, exposing Gondwana and Lameta beds. Puranic rock is found in various places in south and it consists of Shells, Slates, Lime stones and Sand stones. The Shells are deep red, fine grains with some what nodule structure, much joined but irregular fragments in which thin beds of Limestone occurs. Major section of this rock is noticed in Painganga and its tributaries. These beds are nearly horizontal and at places it is *riboned jasper* is inter stratified at some places.

Disintegration of the basalt produces soils of various kinds considerably in depth and physical properties. The soils produced by the common variety of basalt vary from sandy and clayey loam to a hard reddish murrum which is often found mixed with boulders of various sizes. All the soils are mixed with sand, lime, gravel at some places. On plains the hard cores are frequently found on the surface in form of small boulders embeded in light yellow soil often with a shallow layer of black soil. On the hill sides and plateaus common type of soils are formed due to disintegration of trap known as

murum mixed with boulders and some places soils occur in the form of Clay which are generally water logged. The hard beds of blue black rock form little soil owing to partial disintegration of the same and in the area where black sheet rock is exposed in the pockets and rewinds forming soils which are generally favourable for tree growth. The vertical columns of basalt generally structure and disintegrated into black soil, most of which support root system of Teak so that the teak trees attained fair size.

SECTION I.4: CLIMATE

1.4.1 The climate is hot and dry type specially from the 1st week of April to 2nd week of June. May is generally, the hottest month and the maximum temperature recorded in the month of May is 48.7 °C. The nights in this area are generally pleasant even in the hottest whether. This area represents pronounced seasonal variations i.e. Summer season, Rainy season and Winter season. The summer starts in the month of March and continues up to June. The rainy season starts form 2nd week of June and continues till September. Whereas the Winter season commences from November and continuous upto February. The mean minimum temperature and mean maximum temperature recorded are 4.8°C and 45.9 °C respectively.

TABLE NO.– 1
AVERAGE MINIMUM AND MAXIMUM TEMPERATURE RECORDED

Year	Place	Yavatmal Dist.		Maharashtra State.	
		Minimum temp. (0°.)	Maximum temp. (0°.)	Minimum temp. (0°.)	Maximum temp. (0°.)
1994-1995	Yavatmal	4.80	46.10	2.80	48.70
1995-1996		11.00	44.80	2.60	46.20
1996-1997		10.50	44.70	4.80	47.10
1997-1998		10.60	44.70	4.80	47.10
1998-1999		11.20	45.60	4.80	47.10
1999-2000		11.20	45.60	2.40	47.70
2000-2001		11.20	45.60	5.60	45.60
2001-2002		11.20	45.60	5.60	45.90
2002-2003		5.60	45.90	5.60	45.90
2003-2004		6.20	44.80	4.70	45.90
2004-2005		5.80	45.90	4.20	46.30
2005-2006		9.80	47.00	5.40	47.10
Average Temp.		9.09	42.39	4.44	46.71

SECTION I.5. RAINFALL

I.5.1 The precipitation in this area mainly received through South Western monsoon however a little rainfall is also received through North East monsoon. The rainfall received in this area is harvested in Dams, Tanks and Wells and this water is then utilized for agriculture, drinking and other purposes. The dams are connected through canal network to the area of utilization, by lifting water from tanks and wells with the help of both electric and diesel pumps major sources of irrigation, drinking and other purposes.

The rainy season commences from 2nd week of June and continues upto September, however most of the precipitation generally complete by end of August. In this area approximately 90% of annual rainfall is received during the months of monsoon, which is generally regular, but in other season the rain is uncertain. The average rainfall received in this area varies from 889 mm to 1302 mm having an average rainfall of 1000 mm. The number of rainy days are around 54.

**TABLE NO.- 2
AVERAGE ANNUAL RAINFALL RECORDED**

Year	Average rainfall in talukas of Pusad Forest Division				Average
	Digras	Pusad	Mahagaon	Umarkhed	
1995	1268.70	1357.90	1081.00	1499.10	1301.60
1996	730.60	1003.00	864.30	1068.80	916.67
1997	671.60	893.70	846.80	1108.60	880.17
1998	815.30	1179.90	1235.00	689.30	979.87
1999	1027.42	1205.90	982.40	541.88	939.40
2000	836.50	628.20	691.10	477.00	658.20
2001	816.00	1032.80	1008.00	639.30	874.00
2002	986.30	1325.10	1058.90	647.40	1004.40
2003	697.00	962.90	1070.00	830.50	890.10
2004	460.00	507.69	460.52	368.74	449.23
2005	964.00	1066.70	1309.60	669.50	1002.00
2006	1202.00	1041.00	986.50	854.20	1021.00
Average	1137.00	1342.00	1282.00	1024.00	1914.70

The climatic condition of Yavatmal Dist is generally considered to be healthy climate. However some of the parts of Kelapur are infested with Malaria at the end of rainy season.

SECTION I.6: WATER SUPPLY:

I.6.1. In this division *Painganga* and its tributaries *Pus*, *Arunavati* and *Adan* drain the entire area. In the rivers of *Painganga* and *Pus* the water flows throughout the year and villages located along with the banks of the rivers are better placed for availability of water in summer. Some of the villages other than located along the banks of the rivers feel the shortage of water in summer specially at the end of May. The situation is further deteriorated due to very little rainfall in the recent past. Even now there is scarcity of water in the Pusad town. The drainage is poor in most of the area due to highly compact soil and the potential of ground water i.e. also poor due to stratum represented by highly impervious basalt rock.

There are three major irrigation projects in the division. These are -

1. Pus Project of Marsul, Pusad.
2. Upper Painganga Project at. Isapur, Pusad.
3. Arunavati Project at Swanga, Digras.

Three medium irrigation projects are also there in the division. These are -

1. Lower Pus Project, At Veni, Mahagaon,
2. Deogaon Project, At Deogaon, Digras
3. Nignoor Project at Nignoor, Umarkhed.

Three minor irrigation projects are also there in the division. These are –

- | | | | |
|----|---------------|----|----------|
| 1 | Itala Project | 8 | Pophali |
| 2. | Rui | 9 | Piranji |
| 3. | Gargoti-I | 10 | Marsul |
| 4. | Gargoti-II | 11 | Darati |
| 5. | Dhanaj | 12 | Senad |
| 6. | Ambala | 13 | Mudana |
| 7. | Taroda | 14 | Nandgaon |

SECTION I.7:- DISTRIBUTION OF AREA:

I.7.1.:- The total geographical area of the division is 4,45,840 Ha. out of which 1,12,782.92 Ha is of forest area. Gupta's Plan dealt with the forest area of 82,809.35 ha and the remaining area of 29,973.57 Ha area transferred to the Painganga Wild Life sanctuary vide G.R.No.WLP –1003/4/CR-98/F-1, dated 24th February 2004. However, this plan deals with management of forest area 69,435.26 ha as 3389.84 ha, of area has been transferred to FDCM. Additional area of 35.36 Ha taken over for compensatory afforestation and notified as protected forest and 78.46 ha also taken over for compensatory afforestation, yet to be declared as Protected Forest are included in this plan. The details of area of various categories are given below.

1. Total geographical area of Pusad Forest Division – 4,45,840 ha.
2. Total forest area of – 1,12, 782.92 ha. Pusad Forest Division
3. Area dealt in Gupta's Plan (After excluding the Painganga Wildlife Sanctuary area of 29,973.57 ha. from total forest area of the division) – 82, 809.35 ha.
4. Area dealt in the present plan - 69,435.26 ha.

(I) After further excluding the following areas from Gupta's plan area-

1. Area given to FDCM – 3389.84 ha.
2. Extended area of Painganga Wild Life Sanctuary – 10,098.07 ha.

(II) And including the following area in Gupta's plan area

1. Area undertaken for (CA) compensatory afforestation declared as PF – 35.36 ha.
2. Area undertaken for compensatory afforestation and yet to be declared as UF – 78.46 ha.

I.7.2. This revised working plan deals with the management of **69, 435.26 ha** of forest area out of **68,905.35 ha of Reserved forest, 451.45 ha of Protected forest and 78.46 ha. of Un-classed forest.** The range wise distribution of the forest area is as under-

TABLE NO.- 3
RANGEWISE DISTRIBUTION OF THE FOREST AREA

S N	Range	Total Area		RF		PF Area in ha.	UF Area in ha.
		No. of Compts	Area in ha.	A-Class Area in ha.	C-Class Area in ha.		
1	Digras	69	16392.93	8243.44	8149.49	--	--
2	Pusad	62	16828.97	15526.30	933.51	369.18	--
3	Shembalpimpri	56	12728.70	7886.45	4762.20	61.47	18.58
4	Umarkhed	38	11222.45	11018.19	203.54	--	--
5	Mahagaon	39	10293.78	8491.47	1781.51	20.80	--
6	Bittergaon	6	1968.43	1908.55	--	--	59.88
	Total	270	69,435.26	53075.10	15,830.25	451.45	78.46

The range wise details of the forest area transferred to Painganga wildlife sanctuary and FDCM are given under

TABLE NO.- 4
RANGE-WISE DETAILS OF THE AREA TRANSFERRED TO PAINGANGA WILDLIFE SANCTUARY AND FDCM

Sr. No.	Range	Area Transferred		Purpose of transfer	Remarks
		RF Area in ha.	PF Area in ha.		
1	Digras	--	--	--	--
2	Pusad	2296.67	--	FDCM	--
3	Shembalpimpri	--	--	--	--
4	Umarkhed	--	--	--	--
5	Mahagaon	2693.68 1093.17	--	Wild Life FDCM	Noti. No.WLP/ 1003/ CR/ 98/ F-1, Dt. 24.12.2004
6	Bittergaon	7404.39	--	Wild Life Sanctuary	
7	Kharbi				
	Total	13487.91	--		

I.7.3. Reserved forests in this revised working plan include the area

A Class: 53,075.10 ha

C Class: 15,830.25 ha

I.7.4. The forests area of Pusad Forest Division covered in 14 toposheets. The toposheets numbers are 55H/8, 55H/11, 55H/12, 55H/16, 56E/5, 56E/6, 56E/9, 56E/10, 56 E/11, 56E/13, 56E/14, 56E/15, 56I/2 and 56I/3. All the toposheets on scale 1:50,000 (1" = 1 mile) have already been digitized. 19 toposheets on scale 1:31,680 (2" = 1 mile) are digitized and marked the compartments on toposheets of 1:50000 scales.

In Pusad division the numbers of villages are 262. The geo-referenced maps of these villages have been procured from Maharashtra Remote Sensing Application Center (MRSAC), Nagpur. These village maps have already been digitized & marked the compartments of "C" class forests on the toposheets of 1" = 1mile scales.

SECTION I.8: STATE OF BOUNDARIES:

I.8.1. The forests were clearly demarcated in the past and the boundaries of the forest areas are maintained. The boundaries are maintained regularly under 1/5th boundary demarcation scheme. There is a clearcut demarcation between 'A' class and 'C' class and also C class and Protected Forests. The existing chains are not properly maintained due to polecity of funds and lack of budgeting funds.

The boundary demarcation adjoining to private lands are also not properly maintained owing to vested interest of local people adjoining to forest area. The demarcation of 'A' Class Reserved Forests is well maintained as compaired to the demarcations of Protected and Unclassed forests. The pre casts pillars are not erected so far in the field. The total forest area and private land boundaries need to be demarcated well on the ground in a phased manner and to be maintained regularly. The proper boundary demarcation and maintenance of boundaries are need of the hour, encroachments are increasing day by day specially on those forests which are adjoining to private lands.

SECTION I.9: LEGAL POSITION:

I.9.1. The Reserve forests have been declared from time to time out of the changes of Govt. land by notifications or occasionally through acquisition under Land Acquisition Act. For the first time in 1871 the State forest were promulgated by the forest rules of 1871 which effected demarcation of Reserved Forests at that time. In 1892 under Berar Forest Law the State forests have been notified from time to time. The forest was notified again in detailed in 1911, when Indian Forest Act was applied to Berar State and also the constitution of State forest under the Berar Forests Law was confirmed by issuing a general notification. Since then the changes in area or classification are notified under the Indian Forest Act.

There are basically two kinds of Forests in the division namely Reserved Forests as declared under Indian Forest Act and Ex private forests. The Reserved forests divided into 'A' and 'C' class according to the principles of forest management. In the 'A' class Reserve forest the rules of fire protecting were strict and closed for grazing could be stringed and fellings were very much regulated. However in 'C' class Reserve Forests rules for fire protection, grazing are not enforced but regulated with few restrictions on felling. The 'C' class Reserve Forests were not merely Protected Forest but their transfer to 'A' class Reserve Forest can be effected without settlement. The Ex-private forests were taken by forest dept. for management not declared either Protected Forests or Reserved Forests and the Indian Forest Act was not applicable to these areas. The private forest were completely vested with the Govt. with the effect of abolition of corporate act 1951 and were taken over by Revenue Dept. The Revenue Dept. utilized the excess areas for various purposes of villages under the recommendations of Nistar officer Yavatmal and they have been subsequently taken over by Forest Dept. Later on these areas are declared as Reserve Forest under Indian Forest Act.

The forest area of Pusad Forest Division included in this plan has been notified as Reserve Forest or Protected Forest under Indian Forest Act except 78.47 Ha. Acquired for compensatory afforestation remained as Unclassed Forest which needs to be proposed for declaration as Protected Forest.

SECTION I.10: RIGHTS AND CONCESSIONS:

I.10.1. In Pusad forest division the ‘A’ class reserved forests are not burdened with any adverse rights and concessions however the ‘C’ class reserved forests and protected forests are heavily burdened by grazing concessions. ‘Nistar’ is provided to the adjoining villages surrounding the forest area and Nistar is distributed to the needy farmers through the Zilla Parishad or Panchayat Samities as per the Govt. resolution no. TRN1162 / 2148-J-Bombay dated 2nd January 1950. Nistar supply is also regulated by CCF (Production) letter to Special Secretary Revenue and Forest Department dated 10th June 1985 depending upon the availability of various types of Forest produce.

10 poles up to 60 cm girth }	To each needy farmer from
2 carts load (2m ³) fuel-wood }	worked coupes.

The Nistar rates are fixed every year in consultation with District Collectors and generally 50% of the market rates.

The Grazing concessions are allowed as per “Grazing Policy” of Maharashtra State depending upon the Cattle Unit and carrying capacity of Forests. The grazing rules have been framed vide Govt. resolution no. MFP-1365/132211-Y dated 6th December, 1968.

The Conservator of Forests is empowered to close any road passing through a block by providing an alternative route.

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CHAPTER II A

FOREST FLORA

SECTION II.1: COMPOSITION AND CONDITION OF CROP

II.1.1 The forest of Pusad Forest Division falls under the category of “**Tropical, dry deciduous forest**” of Champion & Seth’s revised survey of forest types of India and belongs to sub group 5A/Cib “**Southern Tropical dry, deciduous**” and climex these sub types are categorized on the basis of various local factors like soil- texture, depth, soil-moisture, topography and also environmental conditions. Most of these forests are suffered from biotic factors like uncontrolled and heavy grazing, illicit felling and repeated fire incidences and also to some extent encroachments. The forest of Pusad Division situated under soils derived from underlying trap characterized by presence of Teak of different qualities depending upon the configuration of ground, soil depth, structure and moisture contents of the soil. These forests are characterized by the presence of quite high proportion of Teak, sometimes-practical poor crop of Teak.

II.1.2: Majority forest area of Pusad Forest Division represents by site quality IVa & IVb However, some of the forests areas adjoining to Painganga Sanctuary belong to site quality III where the soil is formed both from trap rock and indigenous are situated along with of Painganga and its tributaries. The forests of this area are characterized by better quality of Teak with good patches of natural regeneration of Teak and miscellaneous species such *Ain, Dhawda, Lendia, Kalam, Tiwas, Tendu, Satpudi, Bhirra, Rohan, Salai, Semal, Behada, Sisam, Bija, Bel, Amaltas, Aonla, Char, Dudhi, Ghoti, Palas, Dhaman, Mohin, Bartondi, Lokhandi, etc.*

II.1.3 General description of the forests: The Forests of Pusad Forest Division are distributed into following types as per the revised classification of Champion & Seth given as under.

II.1.4 The status of established regeneration is very poor and in the forest areas of this Division, the natural regeneration of Teak and its associates is noticed at place during the rainy season which is failed to establish due to various reasons like heavy biotic pressure, repeated fire incidences and hostile soil conditions. Whatever rooted stock seen in these forest areas are mostly coppice origin, and the vigour of Teak and its associates has reduced over the years of working under coppice with standard system resulted in stunted, malformed and crooked tree crop.

II.1.5 The brief description of forest types is as under.

The Forest of Pusad Forest Division categorized into Good quality Teak forests, degraded forests based on the type of forests and local factors which influence the forest quality in this area.

II.1.6 (1) Good quality Teak forests: This type of forests are distributed as narrow strip along the bank of river Painganga where the soil is formed from trap rock and gneiss and it is characterized by deep and accumulated due to siltation from cuts of river Painganga. These forests are in Kharabi & Bittergaon Ranges. Most of the forests of this area belongs to site quality III and some of the patches represent site quality IVa also. These areas are transferred to Painganga Wildlife Sanctuary and presently forms a part of Painganga Wildlife Sanctuary. Teak represents 50 to 60% of growing stock in this area as per the SOFR survey conducted recently in 2004. Density of crop varies from 0.5 to 0.8 and crop generally middle age to mature. The topography of the area is almost plain. The natural regeneration is scanty as younger recruits noticed in the monsoon and fail to establish due to impact of both climatic conditions and biotic pressure. The floristic composition represented in these areas is as under.

Upper Storey: - Teak (*Tectona grandis*) is principal species and main associates are Dhawda (*Anogeisus latifolia*), Ain (*Terminalia alata*), Tiwas (*Ougenia dalbergioides*), Lendia (*Lagerstroemia parviflora*) and Tendu (*Disopyros melanoxylon*). Some of the other associates are satpudi (*Dalbergia paniculata*), Bhirra (*Chlooxylon swetenia*), Kalam (*Mtragyna parviflora*), Rohan (*Soymida febrifuga*), Salai (*Boswellia serrata*),

Semal (*Bombax ceiba*), Beheda (*Terminalia bellirica*). Shisham (*Dalbergia latifolia*), Bija (*Pterocarpus marsupium*) and Bel (*Aegle marmelos*).

Under Storey:- The understorey consists of trees the shrubs, grasses and climbers. The major species are-

Trees:- Amaltas (*Cassia fistula*), Aonla (*Emblica officinalis*), Char (*Buchanania lanzan*), Dudhi (*Wrightia tinctoria*), Ghoti (*Zizyphus xylocarpa*), Palas (*Butea monosperma*), Dhaman (*Grewia tiliacifolia*), Moyen (*Lannea grandis*), Bartondi (*Morinda tinctoria*), Lokhandi (*Ixora parviflora*).

Shrubs:- Bharati (*Gymnosporia montana*), Parijatak (*Nyctanthus arbortristis*), Moroghali – (*Helicteres isora*), Dhayati (*Woodfordia fruticosa*), Raymunya (*Lantana camara*), Tendu (*Diospyros melanoxylon*).

Grasses:- Bhurbhusi (*Eragrostis tenella*), Kodmor (*Apluda varia*), Marvel (*Andropogon annulatus*), Dub (*Cynodon dactylon*), Paonya (*Schima sulcatum*).

Climbers:- Palasvel (*Butea superba*), Mahul (*Bauhinia vahlli*), Pivervel (*Combretum ovalifolium*), Chilati (*Acacia pinnata*), Iruni (*Zizyphus oenoplia*) Gunj (*Abrus precatorius*), Ran kand (*Dioscorea bulbifera*) Ran draksh (*Vitex tenuifolia*)

(2) Poor quality Teak forests:

The majority of forest areas of Pusad Forest Division is covered by poor quality Teak forests which are of mainly coppice origin. The forest of Digras, Pusad, Singad, Shembalpimpri, Mahagaon fall in this category of local sub type. The site quality in these areas is mostly IVb with site quality IVa at very few places especially in the valleys. The area of these forests is mostly undulating and hilly. The density of the crop vary from 0.2 to 0.6. In this area presence of Teak is noticed from 55 to 60% of the area and generally height of the top story is from 10 to 12 meters. The status of natural regeneration is very poor though few younger recruits are noticed in rainy season which fail to establish owing to climatic conditions and biotic pressure. The soil of these forests areas is highly compact, dry, murumy with lot of boulders and with poor soil depth. The floristic composition is almost similar to that of good quality Teak forests.

(3) Degraded scrub forests:

These forests are highly degraded with malfarmed stunted Teak growth. These forests are characterized by a very little tree growth and some patches without any tree growth. Some of these forests are managed under pasture, under fodder reserved in the previous Working Plans. The “C” class reserved forests of this Division falls in this category of the forests. The floristic composition is like that of good quality and crooked quality Teak forests except that they have a very few trees and mainly contained scrub and grasses. Majority of these areas situated adjoining to the villages bearing heavy biotic pressure for a long time and degradation taken place over the years due to unregulated grazing, frequent fires and heavy illicit felling. The soil is generally murumy, very dry, highly compact open without any humus. The degradation of the soil takes place over the years and due to that the moisture content and the absorption capacity of most of these forests are very low.

(4) Status of natural regeneration:

The natural regeneration of Teak and its associates is very poor and restricted to a few patches of selected sites. Whatever the regeneration of young recruits are noticed in the rainy season, fails to establish owing to climatic as well as biotic factors. Heavy grazing pressure, repeated fire incidents, uncontrolled cattle movements, human population pressure to meet their demands like firewood and small timber, poor site quality and erratic rainfall are major factors that influence the establishment of regeneration in this forest area. The regeneration survey conducted by Amravati SOFR unit also expressed the same view regarding non establishment of natural regeneration in this area. The survey data of SOFR represents that there are 340.46 recruits of 30 cm height, 290.36 between 30 cm to 3 cm height and 114.80 above 3 cm height in a hectare in these forests.

(5) Injuries to which the crop is liable:

The forests of Pusad Forest Division mostly suffer from unregulated grazing, illicit felling, encroachments and repeated fires significant damage caused by these agencies coupled with erratic rainfall in the last 4-5 years prior to 2005, have effected the growth

of forest crop. The other agencies which caused injury to the forests such as droughts, frost, floods, plants & insects are negligible.

(6) Fire:

Fire is one of the most destructive agencies of forest development which takes place during the dry season that starts from February continuous up to June. During this period the forests are very much vulnerable to fires and the fires that take place by end of winter and at the beginning of summer are not that much damaging. Most of the fires that are taking place in these forests are man made and accidental which hamper the establishment of natural regeneration. The damage is very severe when freshly felled material is lying in the coupe and fire takes place in the plantation. The young regeneration suffers a lot mainly of Teak & other species get damaged or killed due to die back. In this area fires are put by graziers, intentionally or unintentionally, villagers who go for *Mohua* collection to forest and some of the persons working in the forestry operations also. Sometimes it is also noticed while fire protection works are in progress the fire may extend to adjoining forest areas accidentally. Repeated fires in the forest areas of this dry zone during the dry season cause to extensive damage to the tree growth or reproduction. Late fires in the grassy areas or in closed coupes result in fire calamity. In this area fires are generally ground and creeping fires may not reach to crown level as it is in case of conical forests. Fires cause lot of damage not only to regeneration but also to various microbes in the soil which may convert the leaf litter into humus.

(7) Illicit felling:-

Illicit felling is common and also increasing day by day both for commercial and domestic purposes. As this forest is adjoining to border district of Nanded, the illicit cutters within the Division and from adjoining areas indulge in illicit felling in this Division especially where the good quality teak forests are available i.e. along the Painganga river. Sometimes the illicit cutters may come from adjoining State of Andhra Pradesh in groups, cut the teak timber, transport it to Andhra Pradesh illegally where they get higher prices. These organized gangs indulge in systematic illicit – felling along the border of Andhra Pradesh. Local staff may find it very difficult to control such organized

gangs as they do not have proper infra-structural facilities such as communication and transportation etc. If the illicitly cut timber has crossed the border of Andhra Pradesh divisional border it becomes very much difficult to get back the timber. Local people in and around the forest area of the Division may indulge in illicit felling for meeting their domestic needs such as requirement of fuel, small timber, firewood as there is a huge gap between demand and supply of forest produce. People generally indulge in illicit felling due to unemployment, higher prices of some of the forest products in the market like Teak and low investment and less risk. These social causes make the illicit cutters to indulge in illicit felling as trade. Lopping of trees and shrubs for rab burning of field has further deteriorated the situation. In general, illicit felling, lopping and pollarding of forest species has further deteriorated the forest crop in terms of quality and quantity of the forests.

TABLE NO.- 5
ILLICIT FELLING CASES

YEAR	FIRE	GRAZING	ILLICIT FELLING	OTHER	TOTAL
1995-1996	53	1764	53	117	1987
1996-1997	57	71	1502	113	1743
1997-1998	8	62	1391	95	155
1998-1999	54	33	1056	40	1183
1999-2000	34	26	1207	58	1332
2000-2001	40	2	1101	39	1206
2001-2002	12	12	1205	133	1376
2002-2003	21	1269	12	84	1388
2003-2004	25	1367	16	102	1510
2004-2005	1	1000	13	90	1104
2005-2006	23	1143	76	41	1283

(8) Grazing:- Grazing by domestic animals-

This is another damaging agency of forests destroying young regeneration, plantation due to trampling of the areas and excessive movement of cattle population will lead to

compaction of soil resulting in the less porosity of the soil which may not be conducive for the establishment of young regeneration. Uncontrolled cattle movement is very much common in the forests around the villages. Continuous, unlimited grazing is very much harmful for the tree growth and also for the establishment of regeneration. The forest that will establish in the areas where there is regulated grazing or no grazing, on the contrary, considerable damage has been noticed in the areas where there is uncontrolled excessive grazing more than the carrying capacity of the forests. The grazing in the forests is not uniform due to cattle population is restricted to village areas and villages in turn are nearer to water spots. The grazing pressure is very much serious in the forests especially in summer season i.e. February to June. During this period the forests go dry and some areas, the grazers indulge in lopping of trees to feed their cattle. The sheep and goats are not allowed to graze in the forests which are meant for production of timber. However, the forests are still suffering from the grazing of sheep and goats in this region.

(9) Encroachments:-

The encroachments though may not be serious in this area but forest areas adjoining to agricultural fields of farmers are being encroached especially during the month of monsoon. Some of the forest areas have been cleared, denuded and utilized for agricultural purposes.

(10) Damage by wild animals: -

In this area *Nilgai*, *Samber*, *Chital* cause lot of damage to the young regeneration due to grazing by these animals. Chital cause damage to the bark of young growth by rubbing their antlers and wild pigs, hares, and porcupines cause damage in the plantation. Wild pigs damage is noticed in bamboo plantation at the young stage and resulted in their failure in Kharabi and Bittergaon Ranges have been reported. The porcupines usually eat the rizome, bark of *Haldu*, *Moha* and *Amaltas* near the base of the tree, which hampers the proper establishment of the tree. Monkeys cause considerable damage to flowers, and fruits of the trees. Cheetal cause damage to the bark of the Shivan at the base thereby girdling the tree, which results in the death of the tree. The damage caused by wild animals which is not that much serious when compared to damage caused by the other domestic animals. Moreover, the wild animals damage to the forests is compensated both

in the form of propagation of regeneration activities and maintaining the health of forests by removing excess of the certain trees and hence maintaining bio-diversity.

(11) Insects and fungi:-

In this area teak skeletonizer Hepaliya, mecharalis and Teak – defoliator Hybliya peura are common. The insects attack is noticed mostly during rainy season and estimated loss due to Teak defoliator is around 10% in this forest. Insects also attack young crop of Dhawda, Aonla.

(12) Climbers and weeds:-

Damage by climbers mostly confine to the forests along the river bank of Painganga and along the nalla banks in this area. Cheelati, Ironi are the main climbers which cause harm to the forest in this area. Sometimes damage by lantana is also noticed affecting both regeneration and growth by covering forest growth and competing for spaces.

(13) Drought:-

The erratic and scanty rainfall in every year caused drought like conditions in the recent past. The drought effects the growth of plantation, establishment of regeneration and also growth of forest crops as the soil moisture and water are vital ingredients of growth and regenerations.

(14) Frost:-

Injury due to frost is not seen in this area.

(15) Wind storms:-

No considerable damage is noticed due to wind storms in this area.

(16) Soil erosion:-

Soil erosion is noticed in this area especially along the river Painganga and its tributaries. Sheet erosion is very much common in the entire area. Gully formation takes place due to erosion along the river banks. In some of the areas the roots of trees expose due to excessive erosion of the soil leading to the windfall of the trees.

CHAPTER II B

FOREST FAUNA

SECTION II.3 HISTORY OF WILDLIFE MANAGEMENT

II.3.1 :- First time in the year 1870, it is stated in the Berar Gazetteer that the tigers and panthers are numerous in this area and in the past it was dangerous to travel on foot during night time in Yavatmal district. Cheetah could be found near to the Yavatmal town; sometimes panthers come to village areas of the Yavatmal town. The other wild animals that are common in Yavatmal District are Wild dogs, Wolves, Hyena, Jungle cat, Hunting leopard, Sambar, Indian gaur, Cheetah, Nilgai, Black buck, Chinkara & Wild boar.

II.3.2 :- As the area was abundant in wildlife. Prior to 1972 Protection Act, shooting of wild animals was allowed in this area by forming shooting blocks of wild life rich area. In the past wildlife conservation was effected by implementing the provisions of Indian Forest Act, 1927 and shooting rules framed by the Govt. and detailed in the appendix of CP & Berar Forest Manual Volume II combined with Wildlife Birds and the Animals Protection Act, 1912. The Conservator of Forests was empowered to declare the certain blocks of reserved forests in consultation with the Dy.Conservator of Forests as open for shooting. The shooting permits were issued by the Dy.Conservator of Forests. There were 20 shooting blocks Yavatmal Division, included all Ranges except Arni & Darwha are the part of Pusad Forest Division now after re-organization of East & West of Yavatmal Division.

II.3.3 :- In 1952 Indian Board for wildlife was constituted in order to co-ordinate the administration and legislative aspects of wildlife protection. Bombay Wild Animals and Wild Birds Protection Act, 1951 was enforced in Vidarbha in 1961, which enable the actions of provisions of the Act to outside the Reserved Forest areas also. As per the provisions of the Act, the license holders were to get registered with the Wildlife Preservation Officers. These licenses were categorized into 4 kinds i.e.(1) Small Game, (2) Big Game, (3) Special Game and (4) For Pet Animals. The trading of wildlife species

without license was prohibited. With the enactment of Wildlife Protection Act, 1972 implemented throughout the Country except Jammu & Kashmir, the hunting and shooting of all the animals have been banned under the provisions of this Act.

II.3.4 :- The Wildlife Protection Act was amended in the year 1991 by the Parliament which has become more powerful after amendment and as per the provisions of amended Act the hunting of wild animals except as provided in the Section 11 & 12 and issuing of Hunting Licenses have been banned. Protection of special plants as mentioned in Schedule VI have been given. In order to supervise the functioning of various zoos in Indian Central Zoo Authorities have been constituted. Trading of wild animal trophies and articles has been banned. The punishment for the violation any provisions of the above act has been enhanced to 3 years imprisonment and fine of Rs.25,000/- or both.

II.3.5 :- Distribution of wildlife- The Forests of Pusad Forest Division used to support a variety of wild animals especially the forest adjoining to river Painganga and its tributaries. Improvement of road network, various developmental activities, increased of human and cattle population coupled with fragmentation and deterioration of the area and quality of forest have adversely affected the distribution and population of the wild life in this area. The forest areas of Pusad Division especially the tract of Kharabi and Bittergaon Ranges used to provide undisturbed support for good population of carnivores (*panther, hyaena etc.*) And the herbivores (*antelope*), forming the part of Painganga sanctuary at present, whereas the other parts of Pusad Forest Division support a few wild animals. The wild animals now occurring in the tract are –

TABLE NO.- 6

EXTENT OF WILD LIFE IN PUSAD DIVISION

(As per Census on dated 22 & 23 May 2005)

Chital	Barking Deer	Nilgai	Chousinga	Black Buck	Wolf	Jackle	Wild Bor	Hyena
64	111	731	25	25	32	28	370	5
Jungle Cat	Langoor	Rhesas Monkey	Hare	Mungus	Peacock	Owl	Chinkara	Sloth Bear
26	630	289	58	10	483	2	27	14

(A) **Carnivores** – Panther (*Panthera pardus*), Hyaena (*Hyaena hyaena*). This species is commonly seen in this tract. Wild Dogs (*Cuon alpinus*). move in tract in pack. Indian Forest Jackal (*Canis aureus*), Indian Fox (*Vulpes bengalensis*), Jungle cat (*Felis chaus*) are commonly found in tract.

(B) (a) **Herbivores:** - Black buck (*Antelope cervicapra*), Spotted deer (*Axis axis*), Blue bull (*Boselaphus tragocamelus*), Sloth bear (*Melursus ursinus*), Wild boar (*Sus scrofa*), Common langur (*Presbytis pileatus*), Indian hare (*Lepus nigricollis*)

(b) **Birds:-** The Forest Act of Pusad Forest Division supports each fauna. Pea fowl (*Pavo cristatus*), Grey Jungle fowl (*Gallus sonneratii*), Painted partridge (*Francolinus pictus*), Common quail (*Coturnix coturnix*), Crow pheasant (*Centropus sinensis*) are commonly sighted in this area.

(c) **Reptiles:** - Red Sand boa (*Eryx conicus*), Indian Cobra (*Naja naja*), Python (*Python molurus*), Rat snake (*Ptyas mucosus*).

II.3.6: - Injuries to which the wildlife is liable. Destruction of habitat and fragmentation of the forests due to illicit felling, repeated fires and encroachment for cultivation have been affected distribution of wild animal population, scarce and erratic rain fall and the shrinkage of forest cover have led to non availability of water inside the forest especially during summer resulted in decreasing wild animal population over the years. The situation is aggravated with poaching and hunting of wild animals existed in the Division, which led to disappearance of some species of wild animals from this tract.

TABLE NO.- 7
STATEMENT OF POACHING/NATURAL/ACCIDENTAL DEATHS OF WILD ANIMALS.

Year	Offence cases Booked	Poaching			Naural Death			Accidental Death		
		Tig	Pan	Oth	Tig	Pan	Oth	Tig	Pan	Oth
1997-1998	--	--	--	--	--	--	--	--	--	--
1998-1999	--	--	--	--	--	--	--	--	--	--
1999-2000	6	--	--	1	--	1	3	1	--	--
2000-2001	6	--	--	1	--	1	3	--	--	1
2000-2002	5	--	--	--	--	4	--	1	--	--
2002-2003	1	--	--	--	--	--	--	--	--	1
2003-2004	--	--	--	--	--	--	--	--	--	--
2004-2005	--	--	--	--	--	--	--	--	--	--
2005-2006	1	--	1	--	--	--	--		--	--

*Tig-Tiger, Pan-Panther, Oth-Other

II.3.7: -Measures adopted for protection of wildlife.

Some of the developmental activities for the protection and management of wildlife have been taken up in this division. Concept of taking up of soil and moisture conservation works such as construction of nalla bund to augment the water source, no felling of trees along the nalla and water sources, identification of sites of seasonal water sources, development of new water holes by nalla bunds and construction of check dams.

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CHAPTER III

UTILIZATION OF FOREST PRODUCE

SECTION III.1:- AGRICULTURAL CUSTOMS AND WANTS OF POPULATION

III.1.1– Major portion of the Pusad Forest Division is characterized by hilly or undulating areas which are mainly not cultivable but the valleys between the hills have some large patches of good soils. The presence of good soil and low hills and the general distribution of hills throughout the division are responsible for the fact that some of the patches of the land are still remained under forests. In Pusad Forest Division total compartments are 270 and total number of villages are 262 which indicate that in each compartment there is habitation by at least one village. The type of terrain of the Country that also influence the present composition of the human population. The village boundary in this area is known as *siw* and the line between the survey numbers is known as *dhura* and also occasionally known as *sarbandh*. The portion of land may not be cultivated and it may be utilized as grazing ground for their cattle as well as the means of transit for the farmers to reach their fields. Wherever there is a junction of these boundary lines, each of them is marked by *warali* or *earthen mound* or a *bandha dagad* and boundary opened to concerned cultivator is assigned responsibility of keeping this in good conditions. In this area the shrines of *Maroti* or *Hanuman* are common deity of village and of *Marhai* the goddess of smallpox and cholera are noticed also in all villages. The local people perform the festival of *Dasera* for 21 days, during this period people gather in the morning and go around the village singing their local songs in respect of the deity of *Dasera* for one hour for everyday until the full moon of *Kartik* i.e. October and proceed *Maroti* temple with the beating drums to pay homage to the god on 21st day. During summer period the cultivators usually live in their fields where they construct temporary shade called *Mandava*. The cultivators usually take their morning meal *Nyahari* in the field and evening meal (*jewan*) at home.

In the Pusad Forest Division the original cultivators are *Aandhs*, *Gonds*, *Kolams*, *Pardhans* and *Banjaras* and the other communities like *Kunbis*, *Telis*, *Malis* etc. also cultivate the land. The original cultivators such as *Aandhs*, *Gonds*, *Kolams*, *Pardhans* and *Banjaras* have survival in large numbers in comparison with other communities like

Kunbis, Telis, Malis etc.in agricultural practices. The entire grazing belt except southern portion of Pusad division where the soils are poor, the living standard of the population is comparatively better. The irrigation facilities for the cultivators are available from the sources of wells, tanks, major, medium and minor irrigation dams. In the recent past lot of emphasis has been given for the improvement of water conservation and desiltation of tanks, medium and minor irrigation dams. Medium irrigation projects like Pus River Project and Nignoor Project have been providing irrigation facilities to the area around these projects. In the recent past Major Irrigation Project known as Arunavati Project has been completed which provides irrigation facilities to the villages around this project. Many schemes have been under implementation both of Central Government and State Government to improve the water conservation, soil and moisture conservation under various schemes in order to arrest the soil erosion and improve the ground water level for better irrigation facilities.

III.1.2 :- Staple food for the population in Pusad Forest Division is *Jawari*. *Jawari* has no husks and is ground and passed through grinder. Smallest particles, which go through grinder, make fine flour called as *peeth* whereas the coarse/half ground grains remain in sieve called as *kanya*. *Peeth* is used for preparation of *chapattis* or *bhakar* whereas *kanya* are boiled and eaten as rice. These are generally eaten with boiled pulse of *Arhar Daal*. Local population generally chew and smoke tobacco in this area.

III.1.3 :- Based on the soil structure and the productivity potential and colour, 3 types of soils have been identified in this Forest Division. The major class, which is the best having uniform texture and varies in colour from black to dark brown, the second class soil has uniform coarser texture and reddish colour. The third type soil has coarse gravelly and loose friable texture and of colour light brown to gray. Three defects soils as recognized in this Division are mixture of nodular pieces of limestone (*chunkhadi*). Sloping surface (*utarwat*) and excessive admixture of sand.(*walsar*) The difference exist in the alluvial soil of the payanghat plain and the valley and the coarse gravel soil of hilly parts. The former soil is deep and good and the later is shallow and poor. The black colour soil is named as *kali* and the red colour soil is known as *tambadi* and the light colour is known as *pandhari* soil.

III.1.4 :- Most important agricultural crops in this area are *Jawari* and *Cotton*. *Wheat* is generally grown in Pusad Tahsil and over small patches of area. The other cereals grown in this area are *Rice, Bajara, Gram, Barbati, Moong, Udid, Linseed, Tilli, Groundnut, and Soyabean etc.* In kharif season the cultivators generally grow *Jowari, Cotton, Toor, Tilli, Soyabean* whereas in Rabi season *Wheat, Gram, Linseed etc.* Most commonly grown crops are *Cotton, Jowari* in the entire region. The cultivators having practice of growing horticulture crops such as *Orange, Papaya etc.* Now days the cultivators are raising some of the forest fruit species like *Aonla, Char etc.* Some of the cultivators have raised *Teak* plantations; *Bamboo* plantations in their agriculture fields. It has been observed that though cultivators raise private forest plantations but these plantations are not properly taken care off with management practices like thinning and other silvicultural practices. The local forest officers are required to help for better management of these plantations raised by private cultivators. The variety of *Cotton* cultivated in this area is locally called as *Bani* and *Vilayati Cotton* in Pusad area. *Vilayati Cotton* does not give good thread when compared to *Bani* variety but it is hardly comes up with little rain, ripens it and gives 4 to 5 pickings against 2 of *Bani* variety. In this region big farmers cultivate their farms with modern agricultural implements whereas most of the marginal and small farmers practice traditionally farming with wooden or iron plough and a pair of bullocks. In Pusad Forest Division agricultural practices are mostly rain fed, however irrigation facilities are available with agriculture fields wherever there are Major and Minor Irrigation projects and tanks. Canals have been developed in some of the areas for irrigation. Lot of wells and tanks has been constructed for irrigation facilities in this Forest Division especially along Painganga River. With the increase of population in this area development of district as a whole and state of cultivation, the areas that are available for *nistar* purposes are decreasing and the *nistar* areas are available in only such areas that are totally unfit for cultivation. The general status of the people in this area is poor and they do not find areas even to grow any tree species or better fodder crops. Hence there is scarcity of all forest produce as there is a huge gap between supply and demand.

III.1.5 :- In Pusad Forest Division the population density is high. The most of the population around 70% depends upon agriculture and approximately 15-20% population live in urban areas of the district. In this area of Pusad and Yavatmal District as a whole the growth of industries is almost meager and due to this situation most of the population depend upon agricultural and allied practices. With the increased of human and cattle population the dependency on forest is multifold for meeting the requirements of fuel wood, small timber, fodder and other non-wood forest products. Diversion of forest land in the past for agricultural and other purposes, degradation of the forest due to increase of human and cattle population, shrinkage of forest cover due to excessive biotic pressure have aggravated the situation further. The available forests for *nistar* are not sufficient to meet the *nistar* demands of the local people, as there is a huge gap between the supply and demand of *nistar*. In this division *Teak ballies* of 31 to 45 cm in girth are supplied to local people on *nistar* in the past and fuel wood is also supplied on subsidized rates to the local people from firewood sale depots.

III.1.6 :- The forests of Pusad Division have suffered a lot owing to excessive and un-regulated grazing pressure resulting in conversion some of the good forests to poor and ultimately to scrub forests. In some years it is found that the number of animals grazed in the forests seems to be within the limits of carrying capacity of the forests, but the grazing is not uniformly distributed all over the forests leading to excessive grazing more than carrying capacity in some of the pockets whereas less grazing in other pockets. This anomaly results in the degradation of the forest area both quality and quantity in some of the pockets of the forests. The grazing pressure is mostly restricted to the forests that are lying around the villages. That is why over all degradation of the forests is noticed around the villages. In Pusad Forest Division the carrying capacity has been estimated around 79,397 cattle units in 69,435.26 ha. of open forest area. The cattle grazed recorded in the year of 2003 were 69709. It has been observed that there is a decrease in cattle population between 1995 (64,519) and 2003 (that is of 43,306), which clearly indicates that the cattle outside Pusad Division come for grazing regularly either authorisely or unauthorisely. In this division there has been a practice of management of *Ramnaas* by creating separate working circle under fodder development. These *Ramnaas* are closed for grazing with a view of allowing the people to cut the grass in the *Ramnaas* and go for stall feeding of the

cattle of the local people. However, the local people are reluctant to go for stall feeding by cutting the grass in *Ramnaas* or fodder reserved areas, resulting the stall feeding has not become a part and parcel of cattle feeding or cattle management of the local people. The cattle population estimated in this division is as under.

TABLE NO.- 8
TABLE SHOWING CATTLE POPULATION

Cattle	94-95	95-96	96-97	97-98	98-99	99-00	00-01	01-02	02-03	03-04	04-05
1	2	3	4	5	6	7	8	9	10	11	12
Buffalo/Reda	2826	3405	3085	3452	3407	3379	2933	2987	2676	2390	1920
Calf of Buff.	727	783	653	703	629	603	588	511	445	533	357
Cow/Bull	30285	14899	27097	35761	34950	34396	32971	17997	21847	25211	22281
Calf of Cow	13079	14044	11155	10954	11923	11392	11669	10185	9453	9052	8162
Ox	8320	28504	11857	6743	5048	6588	5396	16130	11291	6120	4267
Sheep	4677	4113	3983	3137	4890	3477	2527	3246	3447	0	0
She Goat	4310	2719	2996	3731	4096	2613	3353	2296	1841	0	0
Horse	295	314	279	345	316	263	237	229	202	0	0
Total Cattle	6080505	65164	58612.5	62801	62704.5	60394	56772.5	51475.5	49151.5	41170	28490
Total Animals	64519	68781	61105	64826	65259	62711	59674	53581	51202	43306	36987
Total Amount	53814	59202	52967	58242	55319	54494	52226	46771	45896	42028	329800

III.1.7 :- The population of Pusad Forest Division is 8,01,434 as per the census of 2001. The density of population is 180 people per sq.km. and out of total population the Schedule Tribe population consists of around 13.71% and Schedule Caste is about 10.81%. The main tribes or the major tribes in this area are *Aandh, Gond, Kolam and Pardhan*. The sex ratio is around 936/1000 and literacy percentage of district is of 68.80 % when compared to 85% of the total population that lives in rural areas. Main occupation of local tribes in this area is agriculture. The tribal population in and around the forests depends upon the forests adjoining to them for small timber, firewood, and non-wood forest produce mainly of *grass, Moha flowers, Gum and Tendu leaves*. As there is no *bamboo* in this Forest Division, the *bamboo* is imported from Chandrapur and Gadchiroli Districts for meeting various purposes of bamboo and bamboo products.

TABLE NO.- 9
TABLE SHOWING POPULATION (CATEGORYWISE) SEX RATIO AND LITERACY RATE

Taluka	Total Population	SC	ST	Others	Sex Ratio	Literacy Rate%
1	2	3	4	5	6	7
Digras	134928	11387	17846	105695	932	66.60
Pusad	285458	28726	40003	216729	936	71.80
Umarkhed	222818	31301	29992	161525	943	69.80
Mahagaon	158230	15282	22520	120428	935	67.00
Total	801434	86696	110361	604377	936.5	68.80

III.1.8 :- Markets and marketable products.

In Pusad Division the local people utilize most of the forest products in order to meet their demand. In Yavatmal District Umarkhed, Yavatmal and Pandharkawada are the prominent timber market places. Whatever the forest products harvested in Pusad Forest Division that are transported to local depots located at *Singad, Kharabi and Nagapur*. The quality of teak timber is being exported to Mumbai, Pune, Hyderabad and other adjoining districts of the State. Inflow of the quantity of forest produce to these depots is getting decreased over a period of time due to various restrictions like excessive restriction of felling due to decrease in forest cover as result of unrecorded local consumption, illicit felling, unregulated grazing, frequent fires etc. The various marketable produces that are harvested in Pusad Forest Division are-

1) Timber :-

Small timber is mainly in demand locally for purpose of construction, furniture making, preparation of agriculture implements by the local people. The main prepared species is teak, which is followed by *Ain, Dhawada, Kalam, Tiwas, Bija, Behada & Khair*.

2) Small Timber :-

Most of these species are also in demand locally for various construction purposes. In Pusad Forest Division whatever the forest produce that is harvested may be sufficient to meet the local demands.

TABLE NO.- 10

TABLE SHOWING TIMBER AUCTIONED, REVENUE COLLECTED.

Sr. No.	Year	Timber (m ³)	Revenue (Rs)
1	1995-1996	1448.856	696224
2	1996-1997	636.120	5407039
3	1997-1998	766.662	6127870
4	1998-1999	547.667	5267150
5	1999-2000	1685.975	19372381
6	2000-2001	1557.700	22557525
7	2001-2002	2080.638	14986397
8	2002-2003	1817.097	16139125
9	2003-2004	629.592	5938110
10	2004-2005	319.638	3516018
11	2005-2006	376.263	2906685

3) Firewood:-

With the introduction of modern cooking fuels like LPG gas, electric implements, a few families recorded to modern cooking fuels still firewood is the main cooking fuel for most of the villagers as well as people of Pusad town. The *Dhawada* as fuel wood is most sought of the species for fuel wood and other hard wood species like *Khair*, *Ain*, *Babul* etc. are also preferred over some of the soft wood species like *Salai*, *Moyen*, *Behada*. There are 3 firewood depots (*Jaltan kendras*) in this forest division at Digras, Pusad and Umarkhed and the firewood is provided on the basis of no loss and no profit. As the demand exceeds supply, illicit lopping of the trees and carrying of head loads of lopped branches mostly by the women is frequently noticed in this area. Majority of the ginning mills and processing factories of the area using more coal and oil fuel rather than firewood.

TABLE NO.- 11
FIREWOOD AUCTIONED AND REVENUE COLLECTED.

Sr. No.	Year	Quantity(m ³)	Revenue (Rs)
1	1	2	3
2	1995-1996	194.076	13700
3	1996-1997	0.000	0
4	1997-1998	2606.972	150805
5	1998-1999	254.551	39500
6	1999-2000	1047.055	76426
7	2000-2001	1731.617	262160
8	2001-2002	786.689	129382
9	2002-2003	1608.161	281428
10	2003-2004	77.64	019410
11	2004-2005	0.000	0
12	2005-2006	0.000	0

4) Fodder:-

The fodder species such as Sheda (*Schima nervosum*), Paunya (*Schima sulcatum*), Marvel (*Andropogon annulatus*) etc. have good fodder value under highly relished by the cattle found in lesser quality in the forest naturally. The coarse grasses such as Kushal (*Heteropogon contortus*) and Bhurbhusi (*Eragrotis tennela*) are abundant to which cattle do not relish that much especially during dry conditions. The villagers are allowed to cut the grasses from the closed areas free of cost. Good palatable grasses such as *Pauniya*, *sheda* and *Marvel* have been introduced in some of the maintained ramnas, as they are sold to the local people of native places on the cutting basis. The villagers are very much reluctant to stall feeding practice, as open grazing is cost free and easier. In this division forest areas normally are subjected to heavy, unregulated grazing pressure especially the forest situated around the villages.

5) Thatching grass :-

Two major species of Thatching grasses namely Kusali (*Heteropogon contortus*) and Kans (*Saccharum spontaneous*) are mostly used by poor villagers for the construction of their dwellings. These grasses are available in the forest in plenty.

6) Non wood forest produce :-

Tendu perhaps is one of the major revenue earning forest producer of non wood forest produce. There are 18 *Tendu* units in Pusad Forest Division. The trade of *Tendu* units is having ups and downs regarding the quantity of *Tendu* leaves production. The quantum of revenue earning is decreasing every year. The scattered distribution of *Tendu* leaves; lesser areas available for collection and quality of *tendu* may perhaps force the bidder to quote the lesser prices. *Tendu* leaves collected and revenue earned in the past is given below.

TABLE NO.- 12
TENDU UNITS AUCTIONED, STANDARD BAGS COLLECTED AND REVENUE EARNED.

Sr. No.	Year	Unit Auctioned	Target (Std Bags)	Actual Yield (Std Bags)	Revenue (Actual)
1	1995	18	22600	25490.131	15810273
2	1996	18	22600	24990.156	12383093
3	1997	18	22600	24629.23	11595293
4	1998	18	22600	26100.529	9206370
5	1999	18	22600	26166.547	10661264
6	2000	18	22600	26298.986	11892521
7	2001	18	22600	23370.94	12928932
8	2002	18	22600	23360.504	7718688
9	2003	18	22600	26037.408	10319372
10	2004	3	22600	5598.796	1686000
11	2005	0	0	0	0
12	2006	1	3500	3497.97	813786

7) Dhawada gum :-

Dhawada gum is highly demanded as edible gum in the market. For collection purposes of *Dhawada gum* the entire division is divided into 8 units, which are sold to the contractors in the open auction or by tender confirm at division level. The collection of *Dhawada gum* is approximately 1.5 M.Tonnes collected every year. The approximate revenue collected in the season 2003- 2004 is Rs. 30,236/-. *Dhawada gum* collection sources show decreasing trend in quantity of gum collected and revenue earned out of the sale of the gum collected.

TABLE NO.- 13

QUANTITY OF GUM AUCTIONED AND REVENUE EARNED

Sr. No.	Year	Gum (Qt.)	Revenue (Rs.)
1	1995-1996	16	81500
2	1996-1997	42	71200
3	1997-1998	30	37101
4	1998-1999	35	52150
5	1999-2000	30	35300
6	2000-2001	46	38400
7	2001-2002	45	52250
8	2002-2003	42	43800
9	2003-2004	35	30236
10	2004-2005	38	30266
11	2005-2006	20	15500

8) Rosha grass (*Cymbopogon martini*) :-

The species distributed mainly in Bittergaon, Mahagaon, Pusad and

Umarkhed Ranges. The total division is divided into 4 units. The revenue earned out of the sale proceeds of the Rosha grass is very meagre. Sometimes units were not sold due to less yield or local demand. Other non wood forest produce like *Moha flowers* and seeds, *Charoli*, *Biba*, *Hirda* and *Behada seeds* apart from the fruits of *Tendu*,

Char, Jamoon, Aoula, Imli etc. have good demands in the market. However, the production of these forest produce are very limited. Limited distribution and abundance of the species are the limited factors for the production and the local people mostly consume these items.

Demand and supply of forest produce and pressure on the forest

It has been estimated that the consumption of forest produce i.e. demand per family by the Pusad Forest Division and its FDA projects and accordingly the projection of requirement made depending upon the number of households in each *Taluka* of Pusad Forest Division. The demands of forest produces are as under.

Total No. of households in the division	--	1,55,338
Total No. of land holders	--	1,07,395
Total No. of cattle	--	43,306

TABLE NO.- 14
CONSUMPTION OF FOREST PRODUCE OF EACH HOUSEHOLD.

Sr. No.	Forest Produces	Consumption per households	Total requirement
1	Firewood	1.5 MT	2,33,007 MT
2	Small timber	8 Poles	1,24,2704
3	Agri instruments	2 Poles	2,14,790
4	Fodder	3.5 / Cattle	1,51,571
5	Bamboo	20 Bamboo	3,10,6760
6	Moha flowers	30 kg	46,60,140
7	Moha Seeds	5 kg	7,76,690
8	Gum	5 kg	7,76,690

Method of harvesting and their cost :-Harvesting of timber, fuel wood from the due coupes and thinning is carried out through Forest Labour's Co-operative Societies (FLCS) as well as by the Forest Department as per the prescription of Working Plan. There are 11 F.L.C.S. working in this Division. F.L.C.S. is normally given preference for coupe working first and otherwise it is done by the Dep't. The harvesting cost per

cubic meter comes to Rs.1153.820 in case of F.L.C.S. working and Rs.759.295 per cubic meter in case of Departmental working. The harvesting operations are carried out on the basis of by job or sometimes some operations on daily wages. The rates for various forestry operations are sanctioned every year by the Circle Wage Board Committee presided over by the Chief Conservator of Forests, Yavatmal Circle, in consultation with the representatives of different F.L.C.S. operating in this area. The no. of coupes worked, yearwise is given below.

TABLE NO.- 15
NUMBER OF COUPES WORKED BY F.L.C.S. AND DEPARTMENT

Sr. No.	Year	No of coupes	Coupes Worked by FLCS	Dipartmenal Working of coupes
1	1995-1996	54	Not Worked	--
2	1996-1997	54	Not Worked	--
3	1997-1998	54	Not Worked	--
4	1998-1999	54	10	--
5	1999-2000	54	17	4
6	2000-2001	54	14	--
7	2001-2002	54	15	2
8	2002-2003	54	Not allotted coupes	--
9	2003-2004	54	9	2
10	2004-2005	54	3	--
11	2005-2006	54	2	--
	Total	594	70	8

Lines of export:- Pusad Forest Division definite have a road network, which is very well developed. However, some of the villages in forest areas are not well connected with all weather roads. The Range headquarters are very well connected with all weather roads and most of the Beat headquarters are connected with all weather roads. Road network in this division is approximately 302.5 kms. out of the road

network 302.5 kms. Major transportation of forest produce is done through trucks. Bullock carts are also used for transportation of forest produce in the remote areas.

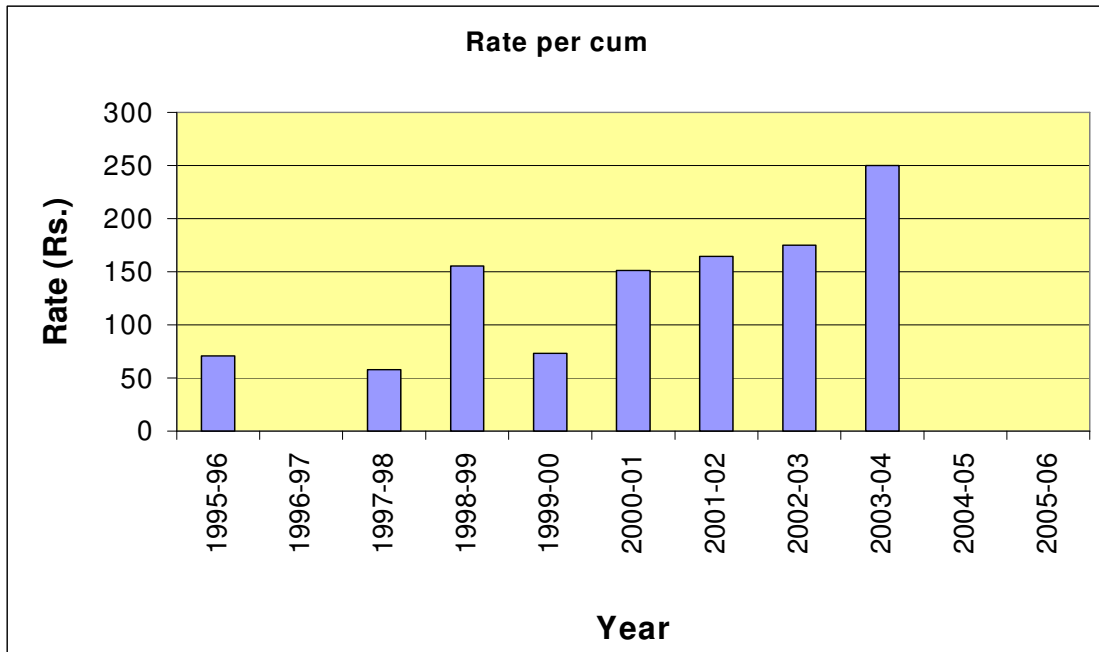
Past and current prices:- average prices obtained in Pusad Forest Division are given below.

TABLE NO.- 16
AVERAGE PRICES OF TEAK TIMBER AND FUELWOOD IN PUSAD FOREST DIVISION

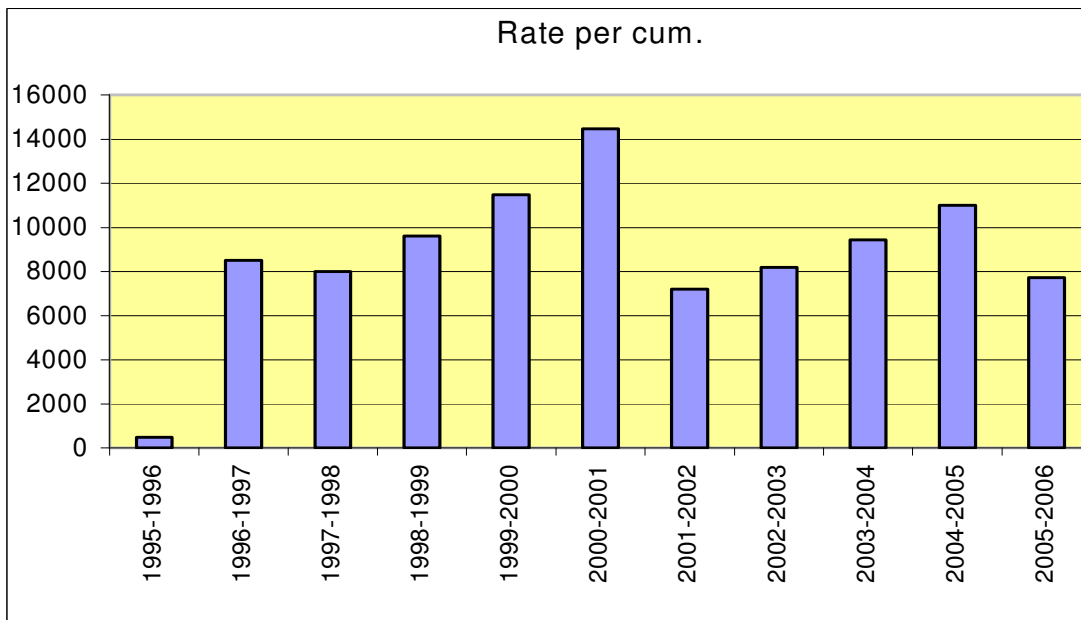
Sr. No.	Year	Teak Timber			Fuel-wood		
		Quantity (m ³)	Revenue (Rs)	Rate per (m ³)	Quantity (m ³)	Revenue (Rs)	Rate per (m ³)
1	1995-1996	1448.856	6,96,224	480.53	194.076	13,700	70.59
2	1996-1997	636.120	54,07,039	8500/-	--	--	--
3	1997-1998	766.662	51,27,870	7993/-	2606.972	1,50,805	57.84
4	1998-1999	547.667	52,67,150	9617.40	254.551	39,500	155.17
5	1999-2000	1685.975	193,72,381	11490.30	1047.055	76,426	73.00
6	2000-2001	1557.700	225,57,525	14481.30	1731.670	2,62,160	151.39
7	2001-2002	2080.638	149,86,397	7202.80	786.689	1,29,382	164.46
8	2002-2003	1817.097	161,39,125	8188.80	1608.161	2,81,428	175
9	2003-2004	629.592	59,38,110	9431.70	77.64	19,410	250
10	2004-2005	319.638	35,16,018	11000	00	00	00
11	2005-2006	376.263	29,06,685	7725	00	00	00

The prices of fuel wood and timber are increasing over years and rate structure is subjected to market fluctuation.

Graph indicating the trend of yearwise price of fuel



Graph indicating trend of yearwise price of teak timber



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CHAPTER IV

IMPACT OF ACTIVITIES BY FOREST DEVELOPMENT CORPORATION OF MAHARASHTRA LTD. (FDCM) IN THE TRACT.

SECTION IV.1:- CONSTITUTION OF FOREST DEVELOPMENT CORPORATION OF MAHARASHTRA LTD.

IV.1.1 :- Forest Development Corporation of Maharashtra Ltd. (an undertaking of Maharashtra State) having headquarters at Nagpur. It was constituted as Forest Development Board in 1969, Subsequently it was converted into Forest Development Corporation of Maharashtra Ltd. In 1974. The F.D.C.M. enabled converting and developing the under stocked and good quality of forest areas into productive forests by introducing viable and production enhancing species. Though the basic aim of F.D.C.M. Ltd is commercial, yet the F.D.C.M. Ltd. follows the principle of management plans in managing all forest areas allotted to F.D.C.M. Ltd.

IV.1.2 :- The principles of forest management through its management plans.

Yavatmal Forest Project Division covers about 31,627.01 ha. area. The area has been allotted to F.D.C.M. Ltd is of 127 compartments of Yavatmal District i.e. Yavatmal, Pandharkawada and Pusad Forest Divisions. The area allotted to F.D.C.M. Ltd. from Pusad Forest Division is about 3389.84 ha. out of total forest area of Yavatmal Forest Project Division. The Rangewise distribution of forest area in the tract under Yavatmal Forest Project Division is given below.

TABLE NO.- 17

FOREST AREA TRANSFERED TO MAHARASHTRA FOREST DEVELOPEMENT CORPORATION

Sr.No	Range	Legal Status	Comptt.	Area
1	Pusad	R.F.	359	295.84
			367	254.96
			371	341.97
			372	352.90
			373	380.01
			374	255.36
			375	415.63
2	Mahagaon	R.F.	808(Part)	173.38
			810	186.19
			812	276.94
			813	134.12
			746	322.54
	Total			3389.84

TABLE NO.- 18**QUANTITY OF FOREST PRODUCE MARKETED**

Year	Teak			Subabool			No. of Bamboo
	Timber	Poles	Fire-Wood (Bit in No.)	Timber	Poles	Fire-wood (Bit in No.)	
1	2	3	4	5	6	7	8
1995-1996	26.861	--	315	--	32811	--	147477
1996-1997	--	--	--	42.846	43606	43608	226631
1997-1998	--	--	--	28.856	13094	--	111389
1998-1999	--	--	--	6.412	1479	--	310054
1999-2000	--	--	--	--	4523	44	252789
2000-2001	333.383	59209	199	--	72234	282.50	107370
2001-2002	357.064	29092	142.50	--	35582	356.50	87246
2002-2003	1559.731	148673	550	309.901	53329	383	303355

TABLE NO.- 19**AVERAGE RATE OF FOREST PRODUCE**

Sr. No.	Year	Bamboo	Teak Timber M ³	Teak Poles Per no.	Teak fire-woods per bit	Subabool per m ³
1	2	3	4	5	6	7
1	1996-1997	3.75	--	--	--	220
2	1997-1998	2.25	--	--	--	400
3	1998-1999	2.00	--	--	--	500
4	1999-2000	3.25	--	--	--	--
5	2000-2001	3.50	6.000	22	290	--
6	2001-2002	3.50	7.800	25	--	--
7	2002-2003	3.85	8.500	30	310	625
8	2003-2004	4.00	7.300	46	330	725

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CHAPTER V

IMPACT OF FIVE YEAR PLANS

V.1.1 :- The forest was a subject of state list till 42 amendments to the constitution of India in 1976. State used to look after the protection, development and management of all the forest resources and generate revenue to its exchequer. The forest was management even before independence on scientific lines in consonance with the prepared Working Plans. The emphasis before independence was the improvement of forest and exploitation of matured and valuable timber species. The expropriatory forest was also brought under the purview of the management after independence. The wildlife was treated as a source of recreation. Till late 70 of last century, no Plan funds were allocated to the forest sector in this area during this period. In this area the forest was very dense and for meeting the demands of the local people for forest produce, the social forestry activities were nil. In this area silvicultural operations were given priority and protection and fire protections were very much emphasized.

With the introduction of Plan, lot of developmental activities have been taken up. Forest sector remained as revenue generating sector and very little amount through non plan expenditure was incurred on forestry sector.

First Five Year Plan (1951-56):-

First Five Year Plan aimed at rehabilitation of degraded forests, introduction of economic species, survey and demarcation of the forest area. During this period Pusad Forest Division was a part and parcel of Yavatmal Forest Division and some of the forests remained as expropriatory forests of this area. The impact of the First Five Year Plan is not noticeable, as the flow of funds was never made available to this tract for requisite achievement of management prescribed in the Working Plan. During this period the forest was managed as per the Working Plan of Robinson.

Second Five Year Plan (1957-60):-

The Second Five Year Plan also emphasized rehabilitation of degraded forest, introduction of economic species, survey and demarcation as the First Five Year Plan enabled forest sector. During Second Five Year Plan Thosres Plan was in progress. During this period systematic management of the forest was introduced.

Silvicultural operations were given main importance in forest management to rejuvenate the forests. Plan funds were not allotted for the operations of forest management. Some of the forest lands allotted to local villagers to raise agri-silvi plantations.

Third Five Year Plan (1961-66):-

Third Five Year Plan emphasized on increasing of productivity of the forest by taking up plantations of fast growing species. Scientific assessment, modern logging methods for extraction of timber as a plan implementation of forest lands was allowed to be given to villagers for cultivation for getting their agriculture crops and during this period lot of land have been allocated to agricultural purposes. However, as the population is low there is no major impact of deforestation experienced.

Agri-silvi plantations were continued during this period also Thosres plan was under implementation. Plan funds were not allotted to any operation of forest management. The plantations raised during this period under non plan funds. During this period the old Yavatmal division was bifurcated into East and West Yavatmal division.

Post 3rd Five year plan (1966 to 1969) -

Thosres plan was under implementation. In this area, there was severe drought condition and the local people were reeling under deep poverty as agricultural crops were completely failed, resulted in lack of employment to agricultural labourers. The main thrust of the Government was to provide work and civil amenities to the people. The foresters were compelled to follow the policies of the Government to provide employment to the people in forestry operations.

Forth Five year Plan (1969 - 1974) :-

This five year plan aimed at increase in productivity of the forest by introducing fast growing species in plantations, assessment of forest on scientific lines and modernizing logging operations. During this period the administration of forest villages were brought under Revenue department. New approach in the field of forest sector emerged in the form of timber board to divert revenue for the development of forest. The forest development board was formed in 1969 and converted into a Forest Development corporation in 1974. Many successful plantations were raised during this period and no direct funding was made available from the plan component.

Fifth Five year Plan (1974 - 1979) :-

During this period Thosres plan was continued up to middle of this plan and in the later period Pal's plan was under implementation. The forestry sector in this five year plan aimed at large scale plantation, social forestry and forest conservation. Social forestry wing was established during this period to involve people to raise the plantation on the lands outside forest i.e. community lands, Government waste lands, etc. The State Government introduced Employment Guarantee Scheme (EGS) to provide employment to the local people by creating assets to the community. During this period lot of successful plantations raised by the department. The scheme of general utility of timber have been introduced.

Annual Plans (1979 – 1980) and 6th Five year plan (1980-1985) :-

During this period thrust was given to save natural forest by providing alternative sources of forest produce through social forestry activities. The decision for regularising encroachment was taken encroachment on forest land from 1/4/1972 to 31/3/1978. This decision has aggravated the problem of encroachment further and many forest dwellers resorted to encroachment keeping in mind that these encroachment would be regularized in future. Pal's working plan was under implementation during this period. Successful teak plantations have been raised in Marwadi block under the plan scheme of GUT (General utilization of timber). However the budget allocation under plan scheme was

meagre, not even 1 % of the total plan budget of the district. During this period Forest Conservation Act 1980 was enacted. The reorganization of forest divisions were effected as a result of which Pusad forest division was carved out from East and West Yavatmal divisions.

7th Five year plan (1985-1990) :-

During this period the Pal's working plan was under implementation. The basic aim of 7th five year plan was forest conservation, massive afforestation and waste land development. Massive afforestation was taken up under EGS scheme and various other plantations were taken up under district plan schemes. The infrastructural facilities like communication, transportations, buildings, etc. were improved. The forest management activities were disrupted as Government of India imposed ban on clear falling of naturally grown forest. The implementation of Forest Conservation Act 1980 gained momentum and the forest wellers were of the opinion that the forest and the acts for conservation of forest were hindering the process of development in forest areas. Plan funds were allocated for the developmental activities under district plan scheme.

8th Five year plan (1992-1997) :-

This plan aimed at protection of forest against biotic interference, utilization of waste lands for forestry activities, creation of awareness among the people for forestry through JFM and conservation of biodiversity. World Bank project was implanted which helped in improving infrastructural facilities i.e. communication, transportation, buildings, etc. and introduction of modern technique in forestry i.e. root trainer nursery. Clonal nurseries, Germ plasm banks, etc Various G.R.'s were issued for implementation of JFM from time to time. During this period the impact of overall development in the forest sector was noticed. DPDC funds allocation was made available for the development of various activities like plantations, roads, buildings, etc under EGS lot of funds were made available for taking up plantations, soil and moisture conservation works etc. In the beginning of the plan no working plan was under implementation and sub sequently Guptas plan came into force during 1996-97.

9th Five year plan (1997-2002) :-

The aims of 8th five year plan were carried forward to 9th five year plan as far as forest sector is concerned. The State Government initiated different schemes for development of forest sector in consonance with Central Government schemes. The period of World Bank project was completed during this period. The plantations of both teak and misc. species were taken up under various schemes. The plan funds flow through DPDC plan.

10th Five year plan (2002-2007) :-

During this period Gupta's plan has been under implementation and this was expired during 2005-06. The present five year plan gave thrust on implementation of JFM through Forest Development Agency, a Central Government added project. In Gupta's plan lot of soil and moisture conservation works were prescribed and accordingly some of the works were taken up under various schemes. The flow of plan funds has come down drastically. Therefore the developmental activities in forest sector are going in a slow manner.

The national forestry action programme was formulated to establish linkage between national forest policy and national five year plan. In the past there has not been a comprehensive and constant programme structure for forestry. Every plan has had its own programme structure therefore, it was difficult to get linkages and establish trends. The budget out lay for forestry sector was hardly 0.032 % of total out lay in 5th year plan and increased to 0.94 % in 8th five year plan. The forestry sector was given higher allocation was in 7th five year plan 1.09 %. The forest sector is one of the most important sectors of the Government which provides tangible and intangible benefits to the community by conserving and maintaining bio diversity. Such an important sector needs sustainable development and this can not be achieved through meagre budget allocation to the forest sector, therefore the budget out lay of the country for forests should be raised 4 to 5 %. Similarly this forest division also, the plan allocation must be in conformity with the national perspective to achieve the objectives of the nations as well as forests.

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CHAPTER VI

STAFF AND LABOUR SUPPLY

SECTION VI.1.REORGANIZATION OF OLD YAVATMAL FOREST DIVISION.

VI.1.1 :- The old Yavatmal Division has been divided into two Forest Divisions i.e. East Yavatmal and West Yavatmal Divisions as per the Resolution of Govt. of Maharashtra, Revenue & Forest Dep't. No.FDM-1363/5718-II-J, dated 3rd February 1964, read with Revenue & Forest Deptt.No.FDM-1364-90385-Z, dated 15th February 1965. In 1983 the Govt.of Maharashtra, R.& F.Deptt. again reorganized East and West Yavatmal Forest Divisions and created three Forest Divisions namely Yavatmal Forest Division, Pandharkawada Forest Division and Pusad Forest Division vide its Notification No.FDM/1-b-F-2, dated 29th August, 1983.

VI.1.2 :- Staff. The headquarters of Pusad Forest Division is at Pusad. There is no Govt. accommodation for the office of Dy.Conservator of Forests. The Dy.Conservator of Forests is the head of the office. The administrative setup of the Division is as under.

TABLE NO.- 20
DETAILS OF STAFF IN PUSAD FOREST DIVISION

Sr.No.	Name of Post	Pay Scale	No. of Post/posts				
			Sanct.	Permt.	Temp.	Filled	Vact.
Class – I							
1	Deputy Conservator	12000-375-16500	1	0	1	1	0
2	Asst. Conservator	7450-225-11500	3	2	1	3	0
	Total – I		4	2	2	4	0
Class – II							
1	Range Forest Officer	6500-200-10500	13	5	8	13	0
	Total – I		13	5	8	13	0

Sr.No.	Name of Post	Pay Scale	No. of Post/posts				
			Sanct.				Sanct.
Class – III							
1	Forester	4000-100-6000	57	27	30	57	0
2	Forest Guard	2750-70-3800-75-4400	174	99	75	153	21
3	Chief Accountant	5000-150-8000	1	1	0	1	0
4	Accountant	4500-125-7000	12	3	9	12	0
5	Clerk	3050-75-3950-80-4590	18	14	4	18	0
6	Surveyor	4000-100-6000	2	2	0	2	0
7	Jeep Driver	3050-75-3950-80-4590	4	2	2	4	0
8	Hatyari Police	2750-70-3800-75-4400	1	0	1	1	0
9	Truck Driver	3050-75-3950-80-4590	1	0	1	1	0
10	Tractor Driver	3200-85-4900	1	1	0	0	1
	Total – III		271	149	122	249	22
Class – IV							
	Daftari	2650-60-2910-65-3300-70-4000	1	1	0	1	0
	Peon	2550-55-2660-60-3200	6	3	3	6	0
	Mali	2550-55-2660-60-3200	1	1	0	1	0
	Watchman	2550-55-2660-60-3200	3	3	0	3	0
	Choukidar	2550-55-2660-60-3200	2	1	1	2	0
	Tractor Cleaner	2550-55-2660-60-3200	1	0	1	1	0
	Truck Cleaner	2550-55-2660-60-3200	1	0	1	1	0
	Wanmajur Male-47, Female-3	2550-55-2660-60-3200	50	50	0	50	0
	Total – IV		15	9	6	15	0
	Grand Total		353	216	137	331	22

VI.1.3 :- Labour supply. In Pusad Forest Division there are no major industries. Labourers mostly depend upon agriculture, forest and developmental works taken up by the other departments. Hence the labour availability is abundant for the forestry

operations in this division. In the rainy season as the agriculture works get momentum being mostly rain fed agricultural areas; hence the labour is in short supply. In general there is no large problem in getting the labourers for forestry operations. The main labour forces constituted in the area belong to the cast of *Aandh, Gond, Pardhan and Banjara*. The division had provided employment in forestry operations of 1,46,616 M.D. in the year 2000-01, 2,34,998 M.D. in the year 2001-02, 2,24,132 M.D. in 2002-03, 3,22,641 M.D. in 2003-04 and 2,36,170 M.D. in 2004-05 which clearly indicates the potential of labour availability and the demand of the employment by the local people.

VI.1.4 :- Accommodation. The staff sanctioned for Pusad Forest Division is of 354 whereas the accommodation is available for 109 staff members only, which means there is a huge gap between available accommodation and requirement of accommodation. The required and available accommodations as per Govt. norms are as under.

TABLE NO.- 21
ACCOMODATIONS AVAILABE AND REQUIRED

Sr No.	Designation	No. of Post	Available accommodation	Requirement of accommodation
1	D. C.F.	1	1	--
2	A.C.F	3	2	1
3	R.F.O.	13	7	6
4	Forester	57	21	23
5	Forest Guard	174	66	93
6	Chief Accountant	1	--	--
7	Accountant	12	7	5
8	Clerk	18	--	18
9	Surveyor	2	--	2
10	Jeep Driver	3	--	3
11	Police Hatyari	1	1	--
12	Truck Driver	1	1	--

Sr No.	Designation	No. of Post	Available accommodation	Requirement of accommodation
13	Naik	1	--	--
14	Dafftari	1	--	--
15	Peon	5	2	2
16	Mali	1	--	--
17	Paharekari	3	--	1
18	Choukidar	2	1	1
19	Tractor Driver	1	--	--
20	Tractor Cleaner	1	--	--
21	Truck Cleaner	1	--	--
22	Forest Labour	52	--	51
	Total	354	109	206

VI.1.5 :- Rest Houses. In Pusad Forest Division there are 3 Forest Rest Houses located at Singad, Bittergaon and Marwadi and in addition to these Forest Rest Houses, there are 19 inspection huts and labour sheds. Lack of budget allocations for the maintenance of these Rest Houses and inspection huts over years, these buildings are not properly maintained. Owing to lack of proper maintenance these buildings are not utilized to fullest extent.

VI.1.6 :- Forest communication. All the Range headquarters are very well connected with divisional headquarter at Pusad by all weather roads mostly of tar roads. The Beat and Round headquarters are connected with Range headquarters by metalled road or fair weather roads. The area of region is fairly connected with state and district services. Telephone communication and the computers are provided to all Ranges.

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CHAPTER VII

PAST SYSTEM OF MANAGEMENT

SECTION VII.1. :- GENERAL HISTORY OF FORESTS.

VII.1.1 Pusad Division is a part and parcel of old forest of Berar. The information regarding forest of Berar is meager before 1865 though the forest of Berar was assigned to British in 1853. During this period the importance and the value of the forest was not realized. The forest of Yavatmal District was in a very dilapidated condition as a result shifting cultivation, indiscriminate felling of the forest, heavy grazing, repeated fires at the will of neighbouring villagers must have been prevalent. The tract of this forest was in very much in under developed stage when it was assigned in 1853. The regular forest administration was initiated since 1865 by the appointment of Assistant Conservator of Forests for entire forest of Berar under the administrative control of Conservator of Forests, Central Provinces. For the first year, few forest blocks were selected and demarcated for reservation. With the reservation the felling was stopped and in 1871 for the first time forest rules were applied in this area to protect the forest from encroachment, illicit felling and unregularised grazing. In 1873 fire protection was introduced in the forest. In 1880 the whole position of the forest was reconsidered and all the waste lands out side the regular reserved blocks were examined. The elaborate classification and nomenclature was introduced and accordingly the waste lands were divided into *A* and *B Class* forest subsequently these were transferred to *A Class* and all these forests under *A Class* set aside as prominent forest for the production of timber, fuel and fodder. The type classification of the forest is as under.

- 1. A class :-** Production of timber and fuel and closed for grazing.
- 2. B class :-** Reserved for production of grass and closed for grazing.
- 3. C class :-** Reserved for fire wood and for the production of timber and fuel.
- 4. Class-II :-** For free grazing lands.

This classification appears to have been completed in 1884 but areas so selected were not notified under the new Berar forest class till 1892. This classification worked very well until the year 1900, when after the famine a boom lands for agriculture set in.

The cotton prices rose year to year resulting in the rise of land prices. With the increase of land under cultivation the grazing area was curtailed while the livestock increased until the free grazing and class – I land could no longer sustain increasing pressure of grazing. The grazing incidences increased from 1.37 acre per head in 1896-97, 0.74 acre in 1906-07. These circumstances therefore compelled to revise the then existing classification. The revision of classification was completed in Pusad Taluka by Commission on whose recommendation the free grazing areas of C-II was either transferred to *A class* or given out for cultivation. or formed to *E Class* (Village free grazing land not under the forest). The new class of forest “*Class D*” was also formed and subsequently this was amalgamated in *C class* in 1911. In the rest of the Yavatmal District there were no free grazing areas i.e. C-II existed and no regular enquiry was held. Land suitable for cultivation was disforested; some of the waste lands afforested and new *A Class* blocks formed out of *C Class* on a small scale. However, no definite policy was laid down.

VII.1.2 :- In 1913 the Chief Conservator of Forests inspected bulk of Yavatmal forests and had come to conclusion that *A Class* forest area of this tract was insufficient to supply the growing demands for timber by increasing and highly prosperous population. The *C Class* forest, on other hand contains large species of *Teak*, which could not be harvested safely unless they were transferred to *A Class* so that the stringent rules regarding felling and grazing could not be applied. Subsequently a joint enquiry by a Revenue Officer and the Working Plan Officer was held and as a result of which about 1/3 area of *C Class* was transferred to *A Class*. Disforestation and exchange of land have taken place subsequently with the main object releasing or exchange the area suitable for cultivation, simplifying the boundary and removing inconvenience to villagers with *A Class* reserved forests.

VII.1.3 :- For a long time even after assignment of district to the British the ex private forests were under the control of private owners, which were subjected to heavy fellings and the grazing resulted in gradually disappearance of useful tree growth and the grazing land available became poor. Out of these expropriatory forests some of the areas survived as good forests as these were situated in interior and inaccessible areas. When the IInd World War began, demand for *Teak*, *Salai* and miscellaneous ballies increased, truck

transportation started and heavy exploitation was carried out without considering regeneration of the forests. Some of the expropriatory forests were survived even after heavy exploitation, subsequently examined and taken over by the Forest Department for the management.

SECTION VII.2. :- PAST SYSTEM OF MANAGEMENT.

VII.2.1 Pre-Working Plan period (1865 – 1914).

Prior to 1865 there is no regular forest management and administration in this area. The regular forest administration was initiated in Yavatmal District in 1865 when forest reserves were originally formed. The main object of the forest management was to restore the degraded ruined forests by giving them complete rest from the felling and by protecting forest against fire and the grazing. However, extraction of the dead wood for meeting demands of sleepers on a small scale was carried out in *Pathrot* area and the exploitation was completely limited to dead wood. The areas were completely closed for grazing. The policy continued up to 1890 when regular working under improvement felling was introduced in Marwadi block under the Painganga Working Plan, the working was restricted to extraction of salable trees, at irregular intervals. The harvesting consists of little more than exploitation of salable material and this was lead to excess fellings.

VII.2.2:- From 1900 to 1915.

By the year 1900 it was realized by the administration that *A Class* blocks were completely closed to felling without carrying any improvement works. and grazing was run at a loss without improvement and it was decided to work them. A series of provisional Felling Scheme were drawn up for the blocks having demand for the forest produce. The system was improvement fellings under 20 years rotation in order to prepare the forest for working under coppice units standard. The working of the forest started under started in 1901 in *Pathrot, and lateron, inJamb, Umarda, Chausala, Dabhadi, Kharoni, Barad, Pokharni, Fiski, Gari and Lonbehel* blocks. The system adopted was to mark the trees to be retained and the offer rest of the crop for sale on cost to the public. In 1905 the system was extended to *Marwadi* block under the name of “*coppice with standard*”. Silviculture operations like cutting back operations were undertaken on a considerable scale in two old felling series for a decade.

VII.2.3 :- From 1905-06 to 1914-15.

By considering the revenue and expenditure the system was in force for 14 years and it was beneficial from the point of revenue and expenditure. The value of salai as a fore-thinner and nurse to teak not realized, Upto 1908 as salai was cut and girdled to a harmful extent in Marwadi and Chausala blocks. In the feminine 1919, due to scarcity of fodder some of the A Class forest was allowed to be opened to grazing and since then there has been a general practice of allowing cattle in A Class forest, which was gradually established.

The work introduced with 3 working circles one for teak areas, one for other species and one for scrub forests. The system adopted was retention of good teak trees and trees of reserved species and the rest of trees were permitted to cut by the purchasers. The system is said to have worked very well in pre-plan period till the year 1900 and brought considerable revenue. But the system gradually became unworkable due to transfer of areas from *C Class* to *A Class*, made the felling series incomplete and heavy grazing destroyed the coppice in worked coupes. Moreover, there is no intensive supervision (as no Forest Guards then patrolled C Class) resulted in heavy illicit felling coupled with bad coppicing.

VII.2.4 :- Post Working Plan period (1915 – 2005).

The regular Working Plan to manage forests was started in 1915 based on the requirement of treatment to the forest, needs of the local population and policies, rules laid down by the Government .from time to time.

VII.2.5 Malcolm's Working Plan (1915-16 to 1937-38)

In 1914 it was decided to replace the previous schemes in order to have effective management by one Working Plan. The preparation of Working Plan was entrusted to Mr.C.A.Malcolm, IFS and his plan was introduced in 1915-16. These forests were managed as per the prescription of Malcolm Working Plan for 23 years. In this plan grazing was recognized to the most important demand on the forest and every effort was made to fulfill the grazing demand of the local cattle population. In this plan main emphasis was to divide the workable forest into 49 felling series and each of 30 annually coupes working under improvement fellings, dividing each felling series into

approximately 30 coupes. Several small under stocked areas were not included in coupes but were left open for grazing in entire plan period in order to provide large area for grazing in order to facilitate the excess cattle population. The cycle of closers to grazing and the sections of coupes were determined in time with a view to provide maximum grazing facilities to the local cattle. At the same time some of the blocks, where heavy grazing noticed closure for 5 to 6 years prescribed in the Working Plan. In other areas where the demand and the area available for grazing the closure was increased to 10 and 15 years. In some blocks large under stocked areas were developed into additional coupes, generally large in size than the workable coupes in the felling series and brought under periodical closures as in case of workable coupes. Cutting back operations after main felling were prescribed. Cleanings & thinning were also recommended in the Working Plan but no regular system was prescribed. The method of exploitation to mark the trees for retention then the coupes were open to purchasers and allowed them to fell any unmarked tree within the coupe. Cutting back operations were carried out in the following area. As a system had got inherent disadvantages and gradually replaced by the departmental felling which eventually included cutting back operations. Under the previous system some coupes were marked, felled by the purchasers, coupled with poor and lack of supervision of the department lead to deterioration of the crop. Practically some of the areas were not worked by the purchasers. The progress of cultivation became rapid, resulting in increased demand. Heavy exploitation was organized after the 1st World War until 1929. In every felling series the demand was full and made it possible to carry out the thinning and cleanings especially in better teak areas. These fillings resulted in replacing all over matured and malformed crop with a new well grown even aged forest in well-stocked areas. However, in poorly stocked open grassy areas, which were filling up slowly, they caused lot of damage by giving set back to the process of recovery. Moreover, as a result of these heavy fellings, forests were over exploited and as a result of which the crop in most of the better quality areas is now young to middle age.

Results:- The growing demand for forest produce in recession resulted in heavy felling in certain areas. Heavy fellings resulted in replacing old crop with the new, well grown coppice forests in well stocked and dense areas but in poorly stocked and open grassy areas as the process of recovery is low, they caused immense damage to the process of recovery.

As a result of heavy fellings, the forests were over exploited. The crop in the most of the better quality areas was young to middle aged.

VII.2.6 :- Robinson's Working Plan (1938-39 to 1955-56).

Shri. Malcolm's Plan was revised by Shri. Robinson which came into force in 1938-39. Shri Robinson prescribed management of the forests keeping in view firstly the interest of local population and secondly the interest of general living. The general objects of management proposed by Shri. Robinson are as under.

- (1) To obtain maximum possible, sustainable annual out turn of forest produce mostly in demand by the local people, principally timber fuel wood, grass, bamboos and other minor forest produce.
- (2) Second object was to meet the demand for grazing for local cattle population.
- (3) To maximize the revenue in consideration with the above aims.
- (4) All *A Class* forests have been worked according to its prescription under this plan. *A Class* forests were categorized into 3 main types namely (1) Good quality teak forests, (2) Medium quality teak forests, (3) Poor quality teak and mixed forests and these were allotted into 3 Working Circles namely, Painganga High Forest Working Circle, General High Forest Working Circle and Coppice Working Circle respectively. The fourth Working Circle namely Miscellaneous Working Circle in which mostly under stocked areas included, out of which 12.4 Sq. miles areas allowed to pasture improvement, 8.5 Sq. miles to fodder reserves and 7.6 Sq. miles of Tiwsala reserve which was kept for Agro Silviculture Plantations. The remaining 13.4 Sq. miles areas consisted small blocks. Besides these categories 3 overlapping working circles were also formed (1) Bamboo Overlapping Working Circle, (2) Teak Plantation Overlapping Working Circle, (3) Bamboo Plantation Overlapping Working Circle. The brief prescription of the plan and the results of working are given as under:

(1) Painganga High Forest Working Circle:-

This working circle constitutes the best quality of teak forests of the Division found along with the river Painganga. The site quality is mostly of III with some patches of site quality II and also site quality IVa & IVb occurred in the patches. One felling series was found in the entire working circle. The main object of the management was to convert the area into even aged crop in 80 years. The method of treatment prescribed was clear felling or concentrated and regeneration felling supplemented by artificial regeneration in under stocked areas. Periodic block-I comprises approximately of workable existing of forest with high proportion of matured trees. The area was divided into 20 annual coupes referred as equi-productive annual coupes. The 3 periodic blocks for unallotted and working to be done over once in 20 years for heavy thinning and selection fellings with due regard to the probable allotment of the areas to the appropriate periodic block in the years to come. The regenerated coupe worked to be tentatively annually as necessary.

The inspection reports of coupe No. I to coupe No.XVII worked under these prescriptions revealed that the areas have failed to regenerate satisfactorily either artificially or naturally but most of the regeneration was from Coppice origin and as the new crop in the earlier coupes. The crop in the coupe No. I to IV, attained the height of 40 and it has started seedlings profusely, from those the new crop would not be the original quality. The planting done over small areas in Comptt. No. 603 and 606 before introduction of the plan gave quite increasing results in artificial generation but after introduction of the plan the worked areas lacking inadequate seeding regeneration of advance growth. The teak plantations raised in the past now taken in the Coupe No.XVII indicate that successful plantations can not be raised in these areas with ploughing and crops ploughing which reduced intensity of grass and helping soil aeration in these slightly heavy soils.

Results:- The areas were failed to regenerate by natural regeneration and most of the forest crop was found to be Coppice origin. The prescriptions to some extent are that no regard was paid to future yield. Prescription of heavy thinning and selection felling in all the remaining areas including the areas fit for PB-II it lead to over exploitation and depletion of higher girth classes especially during the war years.

2) General High Forest Working Circle:-

Medium quality of teak forest of sufficient extent with coupe group together conveniently brought under this working circle. General site quality was of IVa and IVb. The crop present in the forest area was young to middle age. The percentage of teak is generally high, sometimes nearly 100% and seldom below 40%. Reproduction of the teak was generally, satisfactory and in many areas with little or no reproduction also occurred. Mostly teak as principal species in the crop associated with its natural associates. The method of treatment adopted has found in high forest system but the forest was very irregular and the silvicultural system prescribed was conversion uniform. The conversion period prescribed was 60 years by clear felling or regeneration fellings supplemented by artificial regeneration over refractory areas. The Comptts. which were silviculturally most suitable for conversion have been placed in the periodic block-I. Periodic block-I included roughly 1/3rd of the workable area and it was divided into approximately 20 equi-productive annual coupes. Rest of the areas i.e. areas under period block-II and period block-III were unallotted and work to be gone over compartments on 20 year cycle, wherein heavy thinning and selection fellings were to be carried out. The tending operations in the regenerated areas of the periodic block-I were to be carried out annually as long as those operations are necessary. The areas allotted to this working circle are more or less similar or slightly better than the areas allotted to coppice origin working circle. The prescriptions in periodic block-I areas are as under.

1. All teak areas which were coupled with regeneration coupes will be clear felled and all teak advance growth in such areas cut back unless the advance growth attains to fit growth found in groups which will appear suitable to form crop. In such patches no cutting back operations on account malformed species was permitted and the retention of the patches of the regeneration could be considered for the main felling.
2. There are small patches of *Tiwas* forest, which were prescribed for clear felling, but if they were young and promising, thinning and tending works were prescribed.
3. Some patches of teak forest before reproduction in which general thinning and tending for the prescribed area, the Conservator of Forests may order that clear felling in such areas. The well stocked mixed forests were allowed to be worked when there is sufficient demand. 25 trees were allowed to retain as standard along with all young poles girth up to 9 inches.

4. Dead and dying trees were allowed to be felled in under stocked areas. *Moha* and other fruit trees were to be retained for local people.
5. **Unallotted area:-** Thinning in selection fellings are prescribed on a 20 year cycle after the inspection of the area. No regeneration operations or cutting back operations were allowed in such unallotted area, and crown thinning were prescribed. Climber cutting was also prescribed. Selection felling among teak trees over 3ft. girth was prescribed if the trees were available silviculturally.

Results:- Heavy thinning in some areas and selection felling in other areas without any regard to yield resulted in disappearance higher girth classes. As a result of over exploitation under Malcolm's plan the area allotted to this working circle bear very low percentage of higher girth classes. Areas coming under periodic block-I after coupe No.XV areas coming for working in PB-I are with young and middle aged crop. The prescription of the working circle is almost reflected the working of CWR since artificial regeneration was not taken up in any way as prescribed.

3) Coppice Working Circle :-

Major portion of workable forest areas of the division was allotted to working circle. The areas included in this working circle are divided into 48 complete series and 8 half felling series, have been formed each felling series of 20 coupes in each respectively. The silvicultural system was followed coppice with the reserved system. The main prescriptions system were (1) No felling except removal of dead, dying trees under stocked areas, (2) The vegetation of the forests prominently of teak of site quality IVb and V with the small patches of site quality IVa and III. Some of the under stocked area in unworkable areas also occurred.

Under reserve system differential treatment for different areas adopted as per the requirement of treatment to the crop.

(A) General: -

- (1) No fellings allowed to be carried out except dead and dying trees in under stocked areas.
- (2) Areas with steep slopes, which may subject to landslide, were excluded from working.
- (3) The strip of trees retained along the banks of important streams and exploited for teak, however allowed to be felled.
- (4) Healthy *Semal*, *Kulu* and fruit tree such as *Moha* were to be reserved.
- (5) Felling of *Salai* was not obligatory and wherever the interference of the *Salai* with other species was to be felled.

(B) Mixed Forests :-

- (1) The treatment adopted in mixed forest included in this working circle, about 25 of the best available trees per acre, appropriately distributed, were to be reserved as standard and also all the crop of upto 9 inches in girth were to be retained.
- (2) In well stocked mixed forest the working was allowed if there is sufficient demand. Retention of 25 best available trees was also prescribed in such areas and number would change or vary if the climber intensity is more and the retention of the trees could be increased.
- (3) In well stocked patches of young Tiwas and Dhawada thinning were prescribed.

(C) Teak Forests :-

- (1) In better quality teak forest, crops of promising even aged poles of 2 ft. in girth of teak and other viable species were to be reserved after thinning to form part of future crop.
- (2) In other workable areas around 20 well grown vigoran stems of *Teak*, *Ain*, *Sivan*, *Behara*, *Tiwas* and *Dhawada* of not more than 2 ft. in girth could be retained per acre wherever available. Wherever the proportion of teak is very high other species were given preference.
- (3) Subsequent silvicultural operations like cutting back, thinning for achieving proper girth wherever required, were prescribed.

Results:- The system proved to be very suitable to the forest included in this working circle except thinning which at times were quite heavy.

(4) Miscellaneous Working Circle:-

In this working circle by the majority all under stocked areas were included. The areas included 15.5 sq. miles of pasture series, 8.5 sq. miles of ramanas or fodder reserves and 7.6 sq. miles of Tiwsala reserved for agri-silvi plantation.

(A) Fodder Reserves or Ramanas:- 8 blocks were permanently kept closed for grazing in order to meet demand of grass. They served very useful specially in meeting the great demand of grass in Yavatmal town.

(B) 22 pasture series have been earmarked in the entire areas. Each series divided into groups of 4, 5 or 6 coupes, which would be closed for grazing under rotation.

Results:- Prescriptions have improved the quantity and quality of Pasture to a great extent, however long periodic closure provided for improvement of Pasture led to the deterioration of the tree growth in certain lightly grassed blocks due to repeated fires.

(C) Tiwsala Reserves:- This was a small reserve of 4807 acres in the then Kelapur Range, which mainly contained mainly unworkable, open mixed forest. At some places patches of workable mixed forest policy occurred but the natural teak was totally absent. In this area agri-silvicultural operations were prescribed accordingly 1815 acres of land has been planted and these were proved to be successful plantations. As there was a great demand for grass and moderate demand for grazing, the working in these reserves was completely in the hands of Divisional Forest Officer subjected approval of the Conservator of Forests if accepted the following restrictions.

- (1) Not more than $\frac{1}{2}$ of the area would be closed to grazing at one time.
- (2) Thinning in the areas under the orders of Conservator of Forests.

(5) Bamboo (Overlapping) Working Circle:-

The working plan prescriptions found to be suitable. All important bamboo bearing compartments were included in this working circle. 8 Felling Series were formed and each one further divided into 4 annual coupes. Harvesting of bamboo was carried out under standard prescriptions.

Results:- The prescriptions found to be suitable.

(6) Teak Plantation (Overlapping) Working Circle:-

The areas from Painganga High Forest Working Circle and areas adjoining to it suitable for raising teak plantation, were allotted to this working circle. Around 40 acre areas were to be planted by every year after clear felling. The silviculture system was followed in this working circle was Clear felling followed by artificial regeneration of the teak. Cotton crops also to be taken up in the first 2 years after taking up teak plantation, which covered the cost of teak plantation.

Results:- The plantation proved to be quite successful.

(7) Bamboo Plantation (Overlapping) Working Circle :-

The areas that were permanently closed for grazing included in this working circle. *Dendrocalamus strictus* was the main species.

C Class Forest:- These areas are not dealt in the Malcolm's Plan. Robinson prescribed thinning to the congested crops wherever available. Accordingly thinning operations were carried out.

Results:- Heavy thinning were carried out in the certain areas for supply of teak ballies during IInd World War. Besides, absence of forest protection in *C Class* areas resulted in greater deterioration of these areas. Special works of improvement were undertaken.

(1) Fire Protection:- In these forests the fire conservancy began in 1873 till 1911 nearly of *A Class* reserves were protected by means of exterior and interior fire lines with special fire patrols during dry season. As the system was not exactly effective in 1912, the method and principles of fire protection were modified.

- (1) Abolition of fire patrols and rigid protection of all those coupes closed grazing after main felling.
- (2) Early burning of grassy areas
- (3) Isolation of valuable forests for fire protection along with Painganga river.
- (4) Permission to graze heavily along the fire lines.

In 1922 the provincial of rules for fire protection given M.P. Forest Manual were introduced.

Results:- The system of modified fire protection methods worked very well except in Painganga strip and in the grassy areas, which was not burnt well. Extensive closures proved more harmful when compared to benefits in remote areas with the lines grazing because the areas could not be successfully protected from fire due to their scattered occurrences, scarcity of labour and water supply.

(2) **Roads:-** During this period a fire system of graded certain roads have been constructed in larger reserves of the forests areas and in smaller reserves short length of road net work to connect the main district road system either directly or by village track.

Results:- There was an extensive improvement in road communication within the forest areas to help in management of forest and extraction of forest produce.

(3) **Buildings:-** Suitable buildings or suitable quarters provided to all the Range Officers at their respective headquarters, good forest rest houses were constructed at *Singad, Marwadi, Bittergaon, Sondabhi, Kharabi, Korata, Chikhali, Hiwari, Pathrot.*

(4) **Tanks and wells:-** Wells were constructed as per the need at few places.

(5) **Agri-silvicultural operations:-** The idea of raising forest species along with agricultural crop was first conceived in the year of 1900 and attempts were made in the year 1909. Accordingly the seeds of forest species like *Khair, Babul, Ain, Tiwas* were sown alongwith the agricultural crops and these operations proved to be failure due to lack of supervision. Subsequently raising of plantation has been attempted with species of *Babul, Khair, Dhawada, Neem, Bija, Sisham, Sievan, Chandan, Semal.* Some of these plantations were well established and became successful.

VII.2.7 :- Thosre's Working Plan (1955-56 to 1970-71)

Robinson's Working Plan was revised by Shri Thosre which came in existence in the year 1955-56 from 1st July, 1956 and in force up to 30th June, 1971 and the period was further extended upto 1975-76. The forests were managed as per the prescriptions of Thosre's Working Plan under the following Working Circles.

- (1) Painganga Selection cum Improvement Working Circle.
- (2) Coppice with the Reserved Working Circle.
- (3) Improvement Working Circle.
- (4) Plantation Working Circle.
- (5) Pasture Improvement Working Circle.
- (6) Bamboo Overlapping Working Circle.
- (7) Miscellaneous Working Circle.

A brief prescriptions and the results of working in each Working Circle of Thosre's Working Plan are given below.

(1) Painganga Selection cum Improvement Working Circle:-

In this Working Circle the best quality of teak forests occurring along the bank of Painganga river were included. Only one felling series with 2 cutting sections A and B were constituted. The cutting section A included 9875 acres of forests not worked under Robinson's Plan. The crop included in this Working Circle with site quality mostly III, Painganga type forests, which is confined into narrow, elongated mainly as narrow strip along the Painganga river. Results of stock mapping indicate most of the teak forests are capable of growing sound teak trees upto 5' girth. The principal associates of teak are *Ain, Dhawada, Kalam, Bel, Semal etc.* Cutting section A divided into 20 coupes on 20 year felling cycle. The exploitation girth of teak was 135 cms. at breast height over bark and the yield was regulated by area. The forests included in cutting section B is completely young crop and divided into 10 coupes and thinning on a 10 year cycle was prescribed 16.187 ha. of teak plantation mixed with *Semal and Siwan* was prescribed on agro-silvi basis starting from coupe No.I of the cutting section B every year. Mechanical

thinning were prescribed in 5th & 10th year respectively and subsequently light crown thinning was also prescribed on a 10 year cycle. In cutting section A regular thinning and tending operations were prescribed on the basis of 10 year cycle.

Results:- Since the treatment adopted for the area included in this working circle is Selection cum Improvement, the question of sacrificing younger crop in section B does not arise. It was prescribed to remove 140 teak trees of above exploitable girth per year but due to improper execution of prescriptions resulted in over exploitation at times. In the name of improvement marking the pre selection girth class trees were also marked for felling to a considerable extent led to the over exploitation of the forests. Teak plantations of 16.187 ha. in each coupe was coupe were not taken up systematically which indicates the prescriptions of the treatment were not followed scrupulously. It was also observed timely thinning were not carried out resulting in the congestion of plantation that have been taken up.

(2) Coppice with Reserved Working Circle:-

Major portion of workable forest area of the division was placed in this working circle, including the forests previously managed under **General Teak High Forest Working Circle**. The rotation period was fixed at 40 years. Under this working circle 68 felling series were formed and each felling series was divided into 40 equi-productive coupes. The coupes were worked through the contractor system except the coupes of ex Izara and C Class transferred to A Class, which were worked departmentally to meet the demand of small timber and fuel wood to the surrounding population. Thinnings have been prescribed at 10th & 20th year after main felling. The system of treatment adopted was aimed trees of all girth that has attained financial maturity and the retention of which was no longer necessary on silvicultural grounds and the reservation of such trees as are still putting on useful treatment are needed to yield suitable mixture with the teak to protect the soil and supply of seed.

Results:- The results proved to be quite successful out of the treatment of the crop included in this working circle. However, the under mentioned defects were noticed. The contention of these forests are capable of producing sound teak trees up to 60 cm in girth

at 40 year rotation then becoming unsound does not prove to be correct. The forests that was included in Kharabi, Korat, Chikhali, Sondabhi. Morchandi, Masalga, Bhansara felling series of this working circle are capable of producing sound teak trees up to 105 cm. girth. The thinnings carried out were defective as they worked more of revenue oriented thinnings rather than silvicultural thinnings which resulted in over exploitation of the forests. In the prescriptions of subsequently silviculture operations, no cleaning was prescribed with the result the coppice shoots after main felling were allowed to grow, led to heavy competition of coppice shoots and consequently congestion in the crop was noticed. The working plan prescribed that the marking of the main felling coupes in Bhansara, Satara, Anjankhed, Kharabi should be done by the gazetted officer but this was never followed. The result was, that the prescriptions have not been scrupulously followed.

(3) Improvement Working Circle:-

In this working circle crooked, stunted, malformed and open teak forests situated in remote area were included. Low density, poor quality forests devoid of practically any regeneration due to heavy growth of thick grass especially in Kharabi & Jaorala plateaus with scattered patches of better density crop occurred along main nallas included in this working circle. The forests included in this area were largely uneven age of unsound and malformed stems with high percentage of teak. The felling cycle was fixed at 20 years.

Results:- It was observed that the prescriptions were not rigidly followed as a result of which over exploitation took place in the crop. Moreover, the size of annual coupe was approximately 400 ha. which was very large to control and supervise by the staff.

(4) Plantation Working Circle :-

This working circle includes old teak plantations in Tiwsala and Kinwat series and other suitable areas for raising teak, fuel and fodder plantations. The main aim behind the formation of the working circle is to plant under stocked and mixed forest areas situated in compact blocks of more than 100 acres and capable of growing quality III to IVa teak, by agri-silvi plantation and also growing better plantations of fuel and fodder as per the suitability of the site.

Results:- The prescriptions in teak and mixed plantations raised during the period of the plan has shown wide variations in success. The factors, which were responsible for this, are – (1) Soil conditions, (2) lack of tending the crop after plantation. Only 135.415 ha. of plantations have been taken up out of proposed 530.500 ha. area of plantation in this working circle.

(5) Pasture Improvement Working Circle:-

In this working circle open or scrubbed forests classified pasture lands according to classification made on functional basis have been included. These areas were not capable of producing either valuable timber or fuel and are subjected to intensive grazing. The main object of management of the forests included in this working circle is to provide grazing to the maximum, possible extent in consistence with the preservation and improvement of the pasture. Each pasture series was divided into 4 or multiple of 4 coupes and 1 out of every 4 coupes was to undergo 3 years monsoon closure continuously and then remain open to continuous grazing for 9 years. Operations aiming at improvement of pasture were to be carried out one year before closure. In these areas planting of better fodder species like *Sheda*, *Paunya*, *Marvel* was prescribed. Similarly planting of fodder trees were also prescribed like *Anjan*, *Kachnar*, *Bija* etc. in these coupes one year before closure.

Results:- Effective implementation of the prescriptions made in the working circle could not be achieved as these pasture series were surrounded by cultivations and the villages and the closure became a difficult task. All these areas have been subjected to indiscriminate grazing and as such the object of forming the working circle was not achieved. Teak plantations raised in Deulgaon and Rui pasture series have miserably failed as the prescriptions of raising teak plantations in pasture series as prescribed was not correct.

(6) Bamboo (Overlapping) Working Circle :-

All important bamboo areas were included in this **Bamboo Overlapping Working Circle**. The entire areas were divided into 11 felling series worked under 3 years cutting circle. Bamboos covered only a small area and they are generally of poor quality but of great local importance. Bamboos distribution generally confine to banks of nallas.

Results :- The prescriptions were not systematically followed which resulted in malformed and congested crops. Out of prescribed area of 118.210 ha. of bamboo plantation in this working circle only 122.33 ha. have been taken up. It has been observed almost all the bamboo plantations were practically failure.

(7) Miscellaneous Working Circle:-

All the grass birs, forest villages and few compartments, which have not been included in any working circle, were allotted to this working circle.

- (a) **Grass birs:-** There were 13 grass birs ramnas in the division and some of the grass birs have been fenced. Prescription of the working plan for the improvement of grass birs has been followed to some extent in *Gahuli ramna*. The other grass birs located in Darwha Range where there was no sufficient demand for grass.
- (b) **Forest villages:-** 25 forest villages were in the division. They were managed as per the instructions contained in Para No.68 & 69 of the C.P. & Berar Manual vide Govt. Notification No.FLD-3269-221239-WI, dt.20.12.69. These forests villages have been deforested and they were under the management of the Forest Dep't. as per the provisions of Maharashtra Land Revenue Code, 1966.
- (c) **Unallotted area:-** 6 compartments left unallotted in Thosre's plan. Stock position has proved these areas have comparatively improved and the presence of matured and over matured trees is noticed.

VII.2.8 :- Pal's Working Plan (1976-77 to 1991-92)

Thosre's working plan was revised by Shri B.C.Pal. As per the prescriptions of Pal's working plan, the forest area of Pusad Forest Division has been divided into 8 working circles including 2 overlapping working circles.

- (1) Coppice with Reserved (CWR) Working Circle.
- (2) Selection-cum-Improvement (SCI) Working Circle.
- (3) Teak Plantation Working Circle.
- (4) Pasture Improvement Working Circle.
- (5) Fodder Reserved Working Circle.
- (6) Miscellaneous Working Circle.
- (7) Bamboo (overlapping) Working Circle.

(1) Coppice with Reserved (CWR) Working Circle :-

Major portion of forest areas of the region included in this working circle which is capable of producing small to medium size timber, poles and firewood. The site quality of the teak forest included in this working circle, is poor i.e. IVa & IVb. The crop constitutes mostly teak as principal species, which represents young to middle age. The forest is mostly open, the entire area was divided into 25 felling series with 40 annual coupes of each felling series. The rotation for teak was fixed at 40 years and corresponding girth expected by this time was 85 cm. The treatment adopted in this working circle was reservation of 150 trees/ha. for site protection besides all sound fruit bearing trees along with all the well grown advanced growth of teak and other species upto 40 cms. in girth was to be retained. Clear felling to the tune of 10% of the coupe area or a minimum of 5 ha. in well stocked with a good site quality area for raising teak plantation was also prescribed. The prescriptions of treatment further emphasized that working in blank areas, nalla banks, eroded and very steep slope areas of the forests was excluded from the felling. The yield was regulated by the area. For the purpose of treatment to the forests, The area was divided into 4 categories i.e. (a) Protection area, (b) Young crop, (c) Areas fit for plantation, (d) other areas. The treatment suggested according to each category. Under the system the regeneration of mainly of coppice origin and cutting back operations, after main felling and cleaning in the 6th year of main felling were also prescribed. As per the working plan prescriptions, 1st and 2nd mechanical thinnings were to be carried out at 8th & 15th year of plantation respectively.

Thereafter silviculture thinning (3rd and 4th thinnings) based on the rate of the growth of the crop were to be carried out at 25th and 35th year of the plantation. Thinnings in other crop was also prescribed in the 21st year of main felling in which it was suggested that the thinnings were to be in the favour of teak.

Results:- Since most of the area have been regularly managed under CWR system right from beginning of 1938-39 as per the prescriptions of Robinson's working plan resulted in reduction in coppice vigour, teak and its associates and these forests were repeatedly managed under coppice system. The stocking of teak had increased in the forests over the years owing to poor coppicing power of miscellaneous species. In addition, the soil has become highly compact due to adverse biotic factors, heavy grazing pressure, illicit felling, frequent fires and as a result of which the young natural regeneration of teak and its associates did not come up and found die back before getting established. The reduction of coppice shoots to 1 to 2 per stool as prescribed in the working plan had not been followed scrupulously resulting into number of shoots getting established from the same stool. The resultant of coppice crop was stunted, malformed and pollarded to a great extent, constitutes high proportion of teak, up to 60% of the total stocking.

(2) Selection-cum-Improvement (SCI) Working Circle:-

In this working circle best quality of teak forests belonging to site quality III along the banks of river Painganga, managed under **Painganga Selection-cum-Improvement Working Circle** during the previous plan were included. These forests were also managed under **Painganga High Forest Working Circle** prior to Thosre's plan. At the beginning of the plan, in this area the crop was uneven aged with inadequate regeneration. The principal species in this area was teak of site quality III and the area was mostly inaccessible and undulating and at places it was represented by ravines. The selection girth was fixed at 130 cm. over bark and felling cycle was fixed at 20 years. 2 felling series namely Painganga-I and Painganga-II were formed. The yield was to be regulated by area. 1/3rd of the total teak trees above selection girth was to be marked for felling and all miscellaneous trees above 135 cms. girth except certain reserved species were to be marked for felling if those trees are available silviculturally. In the

remaining crop light thinning was prescribed to remove congestion in the crop. It was prescribed that the preparation of treatment map showing the following categories in the coupe -

- (a) Protection area.
- (b) Workable area.
- (c) Areas for diffused plantation.

Diffused plantations were prescribed in patches not less than 0.5 ha. as per the suitable crop site. Cutting back operations in the next year of the main felling and cleaning in the 6th year were prescribed. Mechanical thinning was to be carried out in the teak plantation and a thinning schedule was also prescribed in old teak plantation. The thinnings were suggested in favour of teak.

Results:- Considerable changes in the crop are not noticed as the condition of crop remained more or the same. The density of the crop varies from 0.5 to 0.8 and the teak constitutes main species of the crop. The crop is middle age to matured and the regeneration of teak and other species is inadequate. Presently the area falls in **Painganga Wildlife Sanctuary**.

(3) Teak Plantation Working Circle :-

The old teak plantations taken up in the past and the areas suitable for growing the plantations of teak and other miscellaneous species in future were included in this working circle. The basic object of management was to convert the existing inferior quality and less valuable mixed of good site quality into valuable and superior teak forests. The treatment adopted prescribed in this working circle clear felling followed by artificial regeneration. The site quality of the forests included in this working circle belongs to III and IV. The teak plantations raised in Robinson's plan have attained site quality III and were fully stocked whereas teak plantations raised during Thosre's plan showed variable success. The crop was young, miscellaneous species such as *Sissoo*, *Semal*, *Siwan*, *Sisham* and *Eucalyptus* found in strip teak plantation but the miscellaneous species have failed. The area included in this working circle for rising new plantations, has been divided into 2 felling series with 40 annual coupes whereas the area under old

plantations was divided into 10 annual coupes. Effective treatment for this area, the area was divided into 2 categories – (a) Unworkable areas, (b) Workable areas. In this working circle subsidiary silvicultural operations like weedings, cleanings, casualty replacements were prescribed. Thinning cycle prescribed 8th to 15th, 25th, 35th and 45th of the plantation. First 2 thinnings were mechanical, whereas the thinnings at 25th, 35th and 45th year of planting were silviculture thinnings.

Results:- The prescriptions regarding thinning in old teak plantation areas found to be satisfactory which were implemented during this plan. The new plantations as per the prescriptions could not be raised with desired success as most of the new sites proposed for plantation were in ripping zones or in valley depression. Proper rab burning and stump uprooting had not been carried out at the time of planting, resulted in the formation of multiple coppice roots and because of these the teak seedlings planted did not achieve desirable growth. Adequate no. of miscellaneous species was also not maintained.

(4) Pasture Improvement Working Circle:-

Pasture lands as per the classification made on functional basis were included in this working circle. These forests were basically open stocked or scrub lands not viable to yield even small timber but for conveniently situated for providing grazing lands to the cattle of adjoining villages. Most of the forest area managed under **Pasture Improvement Working Circle** of Thosre's plan was included in this area. Special objects of the management of the working circle was (1) to check soil erosion, (2) to maintain and improve the existing vegetative cover, (3) providing grazing to maximum possible extent in consistence with the above 2 objects. The forests were in general open and under stocked containing stunted and scattered trees of *Salai*, *Palas*, *Dhawada*, *Hiwar*, *Ain*, *Lendia* and usually thorny species like *Khair*, *Acacia*, *Ber*, *Chilati*, *Barhati*. Common grasses found in this area were *Bhurbhushi*, *Kusal*, *Sheda* etc. Method of treatment adopted for a management was control grazing, improvement of pastures by closing certain areas for grazing and allowing other areas open for grazing. Cattle unit prescribed was 0.40 ha. The total area was divided into 15 pasture series with 4 or multiple of 4 of annual coupes in each series. One out of 4 coupe was to be closed for grazing for 3 years continuously and thereafter the coupe was to remain open for 9 years.

No grass cutting was allowed in closed coupes and the areas were to be protected from fires. Pasture watchers were recommended to protect the area. Introduction of superior fodder grasses and tree species. Contour trenches along with soil and water conservation measures were also prescribed.

Results:- The working plan prescriptions were not followed regularly. The practice of rotational grazing as prescribed could not be effected successfully in the field. In other areas heavy grazing without any improvement works coupled with the heavy biotic pressure resulted in further deterioration of the pasture areas.

(4) Fodder Reserved Working Circle:-

It included the areas situated in the midst of the cultivations and which were capable of producing good fodder grasses locally called as *Ramanas*. Majority of the areas were managed under the same system of the previous working plan. These areas were situated in close proximity of towns and big villages where there is a demand for fodder grasses. The basic objects of management prescribed, to improve in quality and quantity of fodder grasses by introducing better variety of grass species to improve the yield by adopting appropriate treatment to the area. The areas of this working circle were mostly devoid of tree growth and are scarcely wooded. The grasses situated in this area have comparatively less fodder value. The common grasses of this area were *Kusal*, *Aristidia*, *Funuculenta* and grasses like *Sheada*, *Paunya* are scarcely present. Method of treatment prescribed to protect the areas from illicit grazing and frequent fires. All the *Ramnas* were to be fenced with wire fence or cattle proof trenches around these *Kurans*. They were to be permanently closed to grazing and the grasses were to be sold only on cutting basis after October, 31st. Gradually enumeration of unpalatable grasses were prescribed. All the areas were to be fire traced annually.

Results:- Most of the *Ramnas* were worked and maintained as per the working plan prescriptions. The areas could not be closed effectively to the cattle grazing since the majority of them were not wire fenced. The situation has resulted in further deterioration of the soil. The local people did not respond properly towards the system of cutting and purchasing fodder to stall feed their cattle mainly due to availability of grasses in the

forests adjoining to the villages. It has been observed few *Ramnas* were wire fenced and the properly maintained like *Belgaon Ramna* near Singad has luxuriant growth of fodder grasses. In most of the *Ramnas* plantations under different schemes have been taken up but most of these plantations were not successful.

(6) Miscellaneous Working Circle:-

Poor and under stocked forests out of the **Coppice With the Reserved Working Circle**, forests areas managed under **Improvement Working Circle** which did not show any sign of improvement of Thosre's plan and the areas cleared of vegetation growth handed over to other department but Government did not issue any Notification have been included in this working circle. In general the areas were open with teak and its common associates such as *Ain*, *Dhawada*, *Lendia*, *Tendu*, *Salai*, *Beheda*. The method of treatment prescribed to manage the forests was to give complete rest to the forests for natural rejuvenation and otherwise were to be opened to grazing. Fire protection could be carried out regularly.

Results:- Heavy grazing resulted into compactness of soil with no sub soil moisture, and natural regeneration could not establish due to these factors. The general improvement of the area was not possible without soil and moisture conservation methods. The areas found to deteriorate further due to heavy biotic pressure and frequent fires.

(7) Bamboo (Overlapping) Working Circle:-

It includes forests area having bamboo established the areas of *Kharabi*, *Bittergaon* and *Arni* Ranges. It overlaps **Selection-cum-Improvement (SCI) Working Circle**, **Coppice with Reserved Working and Teak Plantation Working Circle**. Patches of management were to meet local demand of bamboo to introduce scientific exploitation of bamboo in order to get maximum yield to increase bamboo area by raising bamboo plantations. *Dendocalamous strictus* as main species in this area, which occurs as middle story confined to hilly slopes, shelter vallies and along banks of water sources. Method of treatment or prescribed was 3 year cutting cycle i.e. A, B and C. Three cutting series were formed with each divided into 3 annual coupes. Bamboo plantations were prescribed in suitable areas along the nalla banks. Strict grazing control and fire protections were also prescribed.

Results:- The bamboo plantations undertaken in the past had not shown any desired success and almost failed to establish. They were affected by wild boar attacks at many places and no bamboo is harvested in the past few years. Stocking of natural bamboo in the forests is negligible.

(8) Wildlife (Overlapping) Working Circle:-

It covers entire forest division. The special objects of the management were to ensure and maintain viable population of wildlife, to preserve for all times areas of such valuable importance as natural heritage for the benefit of wild life & enjoyment of the people. The treatment prescribed for wildlife was to be supplement to the forest practices. Strict implementation of **Wildlife Protection Act, 1972** was prescribed and natural habitats and restricted wildlife places were to be left undisturbed. Prescriptions emphasized digging of water holes, no felling in a radius of 100 mtrs. from the perennial water holes, construction of nalla bunds, arrangement of salt licks at suitable places and strict protection by way of continuous patrolling and by erecting watchtowers etc.

Results:- All the prescriptions were hardly followed before no significance of improvement in the wildlife management was noticed.

VII.2.9. Guptas working Plan (1996-97 to 2005-06)

Pal's Working Plan replaced by Gupta's Working Plan :-

In this working plan the forest area of Pusad Forest Division divided into 7 (Seven) Working Circles with a view of the following general objects of management.

1. To improve the vegetal cover in both quality and quantity in degraded as well as under stocked areas of the forest besides suitable soil and moisture conservation measures.
2. Conversion of coppice forest with the reduced coppice vigor to high forest. To conserve and improve forest cover on steep slopes and catchments areas of various irrigation projects in order to check soil erosion and degradation of these areas and for retarding of siltation of reservoirs thereby mitigating soil erosion.

3. To meet the demands of local people for small timber, Bamboo, Fuel wood, Fodder and the various non wood forest produce by increasing the stock of respective species.
4. To have the participation of the local people and the voluntary agencies in various forestry activities such as protection, development and other management aspects, etc and to create awareness among them about the importance of Forests.

Various Working Circles in Gupts's Plans are as under.

- i) Conservation to High Forest Working Circle.
- ii) Improvement Working Circle.
- iii) Afforestation Working Circle.
- iv) Catchment area treatment Working Circle.
- v) Fodder reserve Working Circle.
- vi) Non Wood Forest Produce Overlapping Working Circle.
- vii) Misc. Working Circle.

In Gupta's plan major area of the forest around 37% allotted to the catchments area treatment Working Circle. It was followed by Improvement Working Circle (21.78%), Afforestation Working Circle (18.17%), Conversion to high forest Working Circle (18.11%), Fodder reserve Working Circle (2.45%) and Misc. Working Circle (2.11%)

TABLE NO.- 22

**NUMBER OF FELLING SERIES AND NUMBER OF ANNUAL COUPES
DUE WORKING CIRCLEWISE**

Working circle (WC)	No. of felling series	No. of annual coupes due
Conversion to high forest wc	8	8
Improvement wc	11	11
Afforestation wc	11	11
Catchments wc	22	22
Fodder wc	02	02
Total	54	54

The total number of coupes worked year wise* so far are as under-

TABLE NO.- 23
NUMBER OF COUPES WORKED

YEAR	WORKING CIRCLE					
	CHF	IWC	AWC	CWC	FWC	TOTAL
1997-1998	---	---	---	---	---	---
1998-1999	3	3	---	4	---	10
1999-2000	7	4	1	9	---	21
2000-2001	6	3	1	4	---	14
2001-2002	7	3	1	6	---	17
2002-2003	---	---	---	---	---	---
2003-2004	5	1	1	4	---	11
Total	28	14	4	27	---	73

- CHF- Conversion to high forests;* IWC- Improvement;*AWC- Afforestation; *CWC- Catchment treatment; * FWC- Fodder working circle

1. CONSERVTION TO HIGH FOREST WORKING CIRCLE :-

- i) The crop included in this working circle was young to middle age with crop density varies from 0.4 to 0.7. The crop mainly copies origin and was stunted and malformed to a large extent with a high praportation of teak which above 60% of the stocking. The site quality was IVB to IV A as teak was principal species with its common associates like Dhawda, Ain, Lendia, Bhira, Char, etc. The majority of this area previously worked under CWR system. The status of natural regeneration was inadequate and the crop had stunted growth due to loss of coppice vigour over a period of time. This working circle was divided into 8 felling series with 20 annual coupes in each. The felling circle prescribed was for 20 years and the exploitable girth was 75 cms. at breast height. The yield was regulated by area. The silviculture system adopted was Conversion to high forest.

The method of treatment prescribed was improvement of soil as the soil has become Compact due to heavy grazing, trampling of cattle, resulted in loss of porosity which did not allow the surface water to percolate down resulted in a condition of little or no subsoil moisture. As a result of which the younger recruits of teak and its associates, which come up naturally, die before they get established. In order to mitigate this problem extensive soil works including tractor ploughing, in coupes or CCT, Gully plugging, Nala bunding, were prescribed.

- ii) Reduction of number of coppice shoots to one for stool in the coppice crop. Teak trees of above exploitable girth was prescribed for felling. No marking prescribed for removal of sound misc. and edible fruit species except dead, dying, decess land Thinnings and tending operations was prescribed in plantation and N.R. was given preference over coppice shoots. Artificial regeneration (50 % teak 50% misc.) was prescribed in the areas wherever necessary keeping 625 seedling (N.R. and A.R. both per ha) For implementation of treatment prescribed the coupe areas was divided into a) Protection area, b) Under stock area, c) Young crop and old plantation area, d) Well stocked areas. Subsidiary silvicultural operation like CBO, cleanings and thinnings were also prescribed in teak and misc. plantations. Ist and IInd thinings were mechanical thinning in 11th and 18th year of plantation. Subsequent thinnings prescribed were silvicultural thinning in 25th and 35th year of plantation. Thinning was also prescribed in other crop areas at 21st year of main felling.

Results :- As per the prescription 8 coupes became due for felling every year and majority of these due coupes had not been worked in the targeted years. Therefore the prescriptions suggested had not been implemented in toto.

The Soil and moisture conservation measures were taken up at few places without following regular prescriptions. The subsidiary silvicultural operations like CBO, cleaning were not carried out as per prescriptions of W.P. Thinnings in teak and misc. plantations and other crop areas were not carried out

as per the prescriptions. Therefore, there is no visible change or improvement in quality and composition of the crop as per the stock map report. The teak consist, as dominant species with approximately 43 % of the total stocking. The results of 2004 enumeration indicate that there is a marginal improvement in the stocking of the forest specially in the lower girth classes of 15/30, 30/45 cms.

TABLE NO - 24

NUMBER OF TREES / Ha IN DIFFERENT WC IN GUPTA'S PLAN AND IN 2003 ENUMERATION

Girth Classes	Conversion to high forest WC	Improvement WC	Afforestation WC	Catchment Treatment WC	Fodder Reserve WC	2003 Enumeration
15-30	100	132	68	90	60	140.61
30-45	99	106	55	80	42	94.29
45-60	71	63	27	51	19	59.84
60-75	88	37	14	33	13	37.78
75-90	25	19	08	18	09	24.91
90-105	11	09	04	09	05	13.75
105-120	06	04	02	03	04	7.32
120-135	03	02	--	02	03	3.63
135 & above	03	02	01	--	02	4.11
Total	366	374	179	286	157	386.19

2 IMPROVEMENT WORKING CIRCLE :-

The areas included in this working circle were managed under CWR working circle, some of the areas of Misc. working circle and part of improvement working circle of the previous working plan. Most of the forest crop represented the site quality of IV B with some patches of IV A. The crop was young to middle age with stunted growth and malformed trees. Dominant species in this forest was teak approx. 62 % of the total stock

with its natural associates like Dhawda, Ain, Hirda, Salai, Kalam, etc. The density of the crop was between 0.4 to 0.6 with some patches of lower and higher crop density. The areas that were included in this working circle were subjected to large scale felling specially teak trees. This working circle was constituted with a view of improving the stocking, composition and condition of growing stock to increase the proportion of valuable misc. species. To check the soil erosion and to conserve the soil and moisture in the area. Total working circle was divided into 11 felling series. The treatment adopted was Improvement felling of malformed crop and thinnings wherever necessary. Implementation of treatment prescribed, the coupe area was to be divided into

Area A :- Protection areas

Area B :- Understocked areas

Area C :- Pole crop and old plantation areas

Area D :- Well stocked areas

Soil and moisture conservation and plantation of teak and other suitable misc. species like Bamboo under planting in the IVth year of plantation were prescribed as per the need of treatment of the particular category of the area. Greater emphasis was given for soil and moisture conservation of this working circle as the soil has become Compact over the years due to heavy grazing pressure, frequent fires resulted in poor drainage as well as poor aeration of the soil. As a result of this condition young recruit of teak and miscellaneous which come up naturally did not get established. Improvement of the crop was prescribed within a span of 10 years by enhancing natural regeneration supplemented by artificial regeneration and intensive soil and moisture conservation works prescribed. Calculation of yield was not carried out as no yield was expected.

Results :- Out of 11 coupes became due every year, majority of coupes have not been worked probably due to shortage of funds. Therefore the treatment to the crop as per the prescriptions had not been implemented completely. There is no remarkable change of crop quality and vegetation cover.

3 AFFORESTATION WORKING CIRCLE : -

The area included in this working circle was 'C' class reserve forest falling outside catchments of various irrigation projects, part areas allotted to misc. working circle, part areas of CWR working circle small areas of miscellaneous working circle, plantation working circle and fodder working circle of previous plans. The area in general was under stocked, opened with crop density normally less than 0.4 with some patches of better-stocked areas in some of the compartments. The 'C' class reserve forest allotted to this working circle is highly degraded without any significant tree crop. Most of the area represents site quality IV B. The crop is with the teak as principal species along with misc. species like Dhawda, Ain, Sal, Tendu, etc. The area was subjected to heavy grazing pressure resulted in compaction of soil with little or no Subsoil moisture. Natural regeneration of teak and its associates was negligible and die back without getting established.

The objects behind the constitution this working circle were

1. To increase vegetative cover
2. To check loss of crop soil through suitable soil and moisture conservation majors.
3. to increase capacity of the soil to increase the productivity of land. 11 felling series with 20 annual coupes in each series had been constituted. The implementation of prescription the coupe area was to be divided into area A (Protection area), area B (Under stocked area), area C (Pole crop and old plantations), area D (Well stocked areas.)

Intensive soil and moisture conservation works prescribed. Afforestation of suitable areas in category in A and B types was prescribed on the basis of ecological index and planting of 1000 seedlings per ha. had been envisaged. Subsidiary silvicultural operations like CBO and cleaning were prescribed. Thinnings 1st and 2nd mechanical thinnings at 11th and 18th year of plantation and subsequently, silvicultural thinnings at 25th and 35th year of plantation was also prescribed.

Results :- Out of 11 coupes due for working, no coupe was wrked in the initial 2 yrs.

Of W.P. period & subsequently majority of the due coupes were could not be worked. The subsidiary silvicultural operations were not attended as per the prescriptions. The soil moisture conservation works were not implemented as per the prescriptions. The field visits indicates that most of the plantations in the division did not come up to the desired level mostly because of grazing, fire & wrong selection of sites & species. The site wise & working circle wise list of plantation & their success rate are given in Appndix No. XXIII A of Volume II of draft plan.

4 CATCHMENT AREA TREATMENT WORKING CIRCLE :-

The forest area comes under catchment areas of various irrigation projects had been allotted to this working circle. The site quality of the crop varies from IV A to IV B the forest was well stocked with patches of under stocked and open areas. The 'C' class reserve forest included was with a little vegetation and the nature of forest of local subtype "poor quality forest" and degraded scrub forest. Special objects of management in this working circle were 1. To check soil erosion 2. To arrest measures the run off water by taking up intensive soil and moisture conservation measures in the catchment area of the forests 3. To preserve and increase vegetative cover to prevent the siltation of reservoirs by checking up of soil erosion in the forest catchment areas 4.To increase the ground water table.

22 felling series with 20 annual coupes of each felling series had been constituted. In this working circle method of treatment adopted were soil and moisture conservation works along with the afforestation in order to prevent soil erosion, siltation of reservoir and to enhance ground water table. The forest area falling in the catchment of each irrigation projects included in this working circle had been treated as a complete unit. For implementation of the treatment prescribed the area of the coupe had been divided into area A (Protection area), area B (Understocked area), area C (Pole crop and old plantations), area D (Well stocked areas.). In D areas 50% teak trees above harvestable girth were to be felled. No felling was prescribed in the areas which directly draining into catchment. Intensive soil and moisture conservation works along with afforestation were prescribed besides

encouragement through natural regeneration and gap plantings. The subsidiary silvicultural operations like CBO cleaning, thinning were prescribed.

Results :- As per prescriptions 22 coupes become due every year and most of these coupes due for treatment could not be worked as per prescribed in the scheduled. It is noticed during the visits to the field a number of coupes declared as unworkable as there was no yield. It was also observed that the other prescriptions given were also left out, though the harvesting was one of the prescriptions.

5 FODDER RESERVE WORKING CIRCLE :-

The areas included in this working circle represent site quality IV B and are mostly without any appreciable Tree growth with species such as Hiwar, Palas, Teak, Bhor, Khair. Most of these areas generally have grasses of less fodder value Kus (Andropogon Contartus), Bhurbhussi (Eragrostis tennela) however good fodder grasses such as shedha, paunya, marvel etc. were scarcely present. The forest included in the working circle belongs to local subtype “degraded scrub forest”. Special objects of management were to improve quality and quantity of fodder by introducing better varieties of fodder grasses, fodder trees species and to meet the local demands for fodder. The treatments prescribed were extensive soil and moisture conservation works, removal of weeds, thorny, shrubs and bushes and eradication of unpalatable grasses like Kushal, burbushi, etc. at pre flowering stage. Sowing of seeds of superior fodder grasses, shedha, paunya, marvel, etc. on the lower side of contour trenches and retention of existing trees except dead trees.

Introduction of fodder tree species such as Subhabul, Anjan, Kusum, Acacia, etc. by way of pit planting in between CCT, erection of wire fencing around the area under treatment intensive fire protection and permanent closing of the area to grazing. 2 felling series were formed with 10 annual coupes each for implementation of the prescriptions. The coupe area was to be divided into A, B, C and D categories. Existing natural regeneration was to be taken into consideration while taking up new plantations.

Results :- The prescriptions were not implemented in due couples. Stall feeding of the cattle i.e. cut and carry practice to feed the cattle has not been followed, as stall feeding is not common in this area. As the areas situated nearby villages and are subjected to unregulated grazing, frequent fires and other biotic pressure resulted in further degradation of these areas.

6 NON WOOD FOREST PRODUCE (OVERLAPPING) WORKING CIRCLE

The main species in this forest is teak and its common associates are Ain, Salai, etc. The non wood forest species produce such as Tendu, Mahua, Char, Dhawda, Hirda, Behada, etc distributed in scattered patches allover the area along with other species. Special objects of management were to improve nonwood forest produce species in the forest thereby enhancing the yield and collection of various non wood forest produce and to enhance employment to local people those who depends upon non wood forest produce. In this area Tendu leaves, Dhawda gum, Charoli, Mahua flowers & seeds and seeds Behada, Hirda and Rosha grass have good market value. The collection of non wood forest produce the entire division divided into various units.

Identifications of compartments with promising regeneration of non wood forest produce species removal of congestion and soil working is prescribed. Soil working in case of Tendu and Mahua by taking one feet deep trench and circling with a diameter around the tree to activate root suckars on plantations introduction 10 to 15 % of Non wood forest produce species prescribed. No non wood forest produce species were not to be marked for felling except dead.

Results :- The prescription made in working circle were not at all followed and implemented therefore no change in composition of the crop with respect to non wood forest produce. More over, there is a decreasing trend in availability of NWFP.

7 MISCELANEOUS WORKING CIRCLE :-

In this working circle the areas handed over to other departments in the past but not disforested were included. "C" class reserved forest areas, which were not given any compartment numbers, were also included.

Results in general: - In this W.C. the situation remained more or less same out of due coupes only 15% coupes worked so far. Therefore visible change in the crop quality and composition is not noticed in this W.C. The enumeration data of 2004 by the SOFR indicates that there is a marginal increase in the stocking of the forest specially in the lower girth classes.

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CHAPTER NO. VIII

STATISTICS OF GROWTH AND YIELD

SECTION VIII.1. STATISTICS OF GROWTH RATE OF TEAK :-

Growth of Teak :-

During the revision of this working plan the studies have been conducted by the office of Conservator of Forests, Working Plan, Yavatmal in 2005 and 2006 with the help of its officers and staff. The Stem analysis of teak (*Tectona Grandis*) carried out by selecting representative teak trees of site quality IV from Pusad and Digras ranges. The results obtained, have been computed and the following curves were drawn.

- A) Age / diameter at breast height over bark.
- B) Height / Age
- C) Age / Volume.

The data is utilized for this plan report.

The data GHB (OB) in cms, height in meters, volume in Cub, mtr., CAI (Current annual increment). MAI (Mean annual increment) are given in the following tables.

Stem Analysis for teak :- Site quality IV.

Forest division	-	Pusad forest division.
Range	-	Pusad
Round	-	Pusad
Beat	-	Warud
Compt. No.	-	346
Team Leader	-	Shri.W.S.Wankar, RFO,W.P., Yavatmal.

STEM ANALYSIS FOR TEAK OF SITE QUALITY IV

Range : Pusad,

Round : Pusad

Beat : Wadad

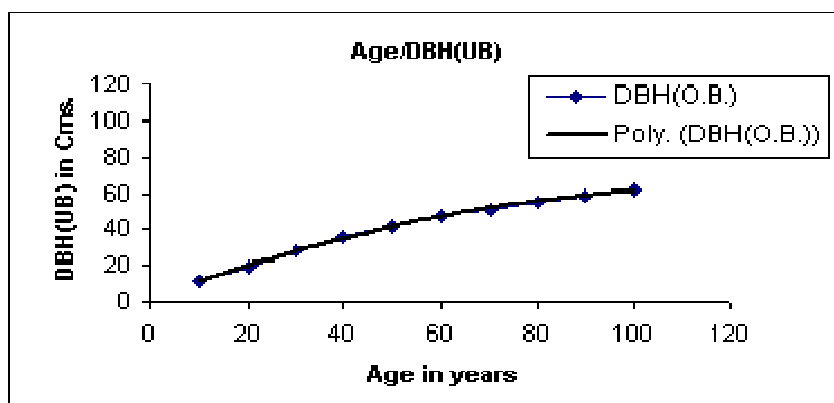
Maker : Shri. S.S. Wankar, R.F.O.W.P.Yavatmal

Comptt.No.: 346

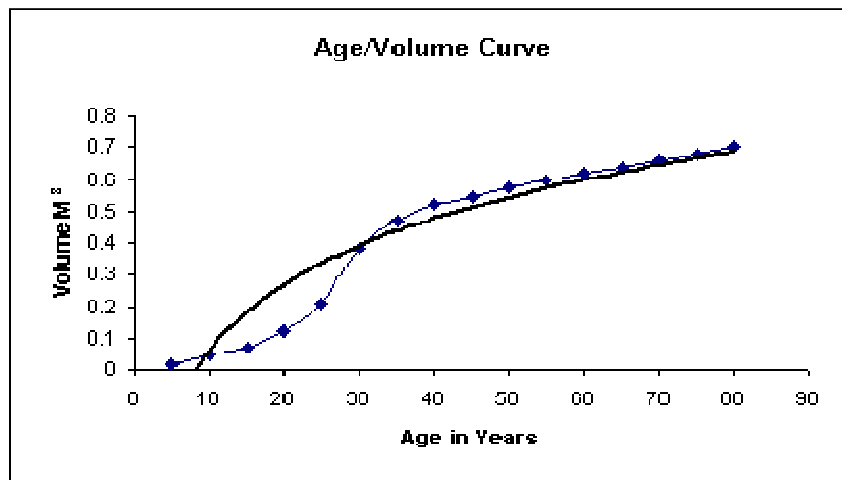
SR. NO.	AGE	GBH(OB)	HEIGHT	VOLUME	CAI	MAI
1	5		1.4	0.02	0.004	0.004
2	10	10.8	2.6	0.044	0.0048	0.0044
3	15		5.0	0.072	0.0056	0.0048
4	20	19.6	6.6	0.124	0.0104	0.0062
5	25		8.0	0.210	0.017	0.0084
6	30	27.8	9.0	0.380	0.034	0.0126
7	35		10.0	0.470	0.018	0.0134
8	40	36.2	10.9	0.520	0.01	0.013
9	45		11.6	0.546	0.0512	0.012
10	50	42.0	12.6	0.574	0.0447	0.011
11	55		13.6	0.600	0.0052	0.01
12	60	47.0	14.1	0.620	0.004	0.01
13	65		14.8	0.640	0.004	0.0098
14	70	51.0	15.4	0.660	0.004	0.0094
15	75		16.1	0.680	0.004	0.009
16	80	54.8	16.8	0.700	0.004	0.0087

Age Girth and Breast Height (Over Bark) Analysis

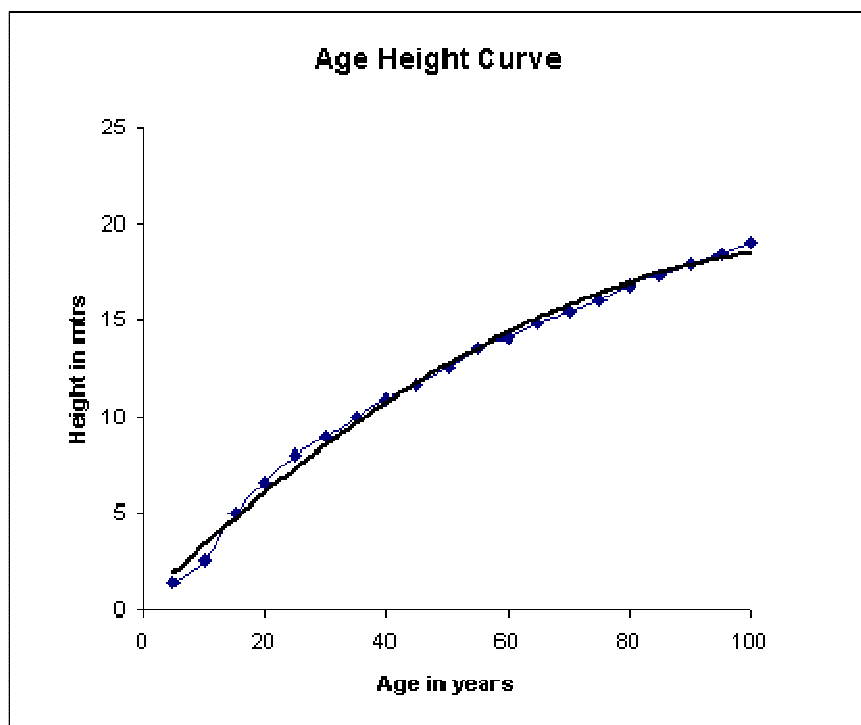
Age in years	DBH(UB) in cms.
10	10.8
20	19.6
30	27.8
40	36.2
50	42.0
60	47.0
70	51.0
80	54.8
90	58.4
100	62.0



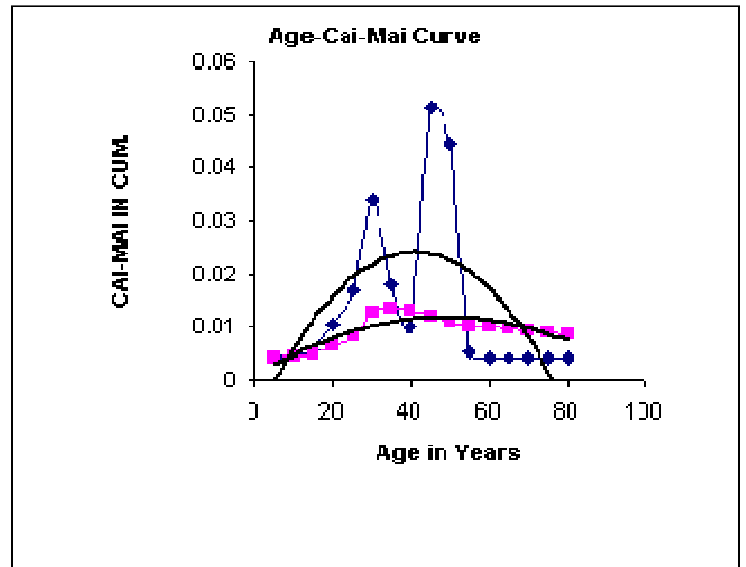
Age in Years.	Volume M ³
5	0.02
10	0.044
15	0.072
20	0.124
25	0.210
30	0.380
35	0.470
40	0.520
45	0.546
50	0.574
55	0.600
60	0.620
65	0.640
70	0.660
75	0.680
80	0.700



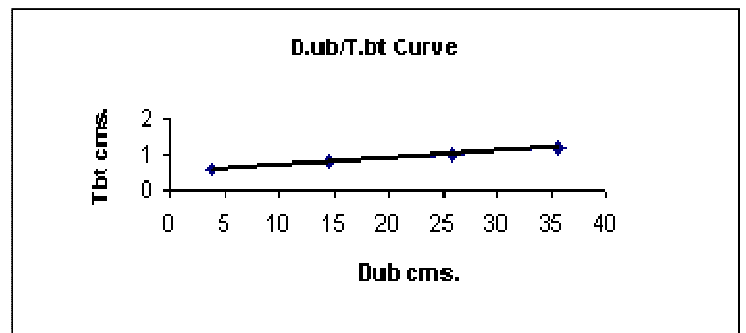
Age in Year	Height Mtr.
5	1.4
10	2.6
15	5.0
20	6.6
25	8.0
30	9.0
35	10.0
40	10.9
45	11.6
50	12.6
55	13.6
60	14.1
65	14.8
70	15.4
75	16.1
80	16.8
85	17.3
90	17.9
95	18.4
100	19.0



AGE	CAI	MAI
5	0.004	0.004
10	0.0048	0.0044
15	0.0056	0.0048
20	0.0104	0.0062
25	0.017	0.0084
30	0.034	0.0126
35	0.018	0.0134
40	0.01	0.013
45	0.0512	0.012
50	0.0447	0.011
55	0.0052	0.01
60	0.004	0.01
65	0.004	0.0098
70	0.004	0.0094
75	0.004	0.009
80	0.004	0.0087



D.ub	T.bt.
3.9	0.6
14.5	0.8
25.9	1.02
35.6	1.2



STEM ANALYSIS FOR TEAK OF SITE QUALITY IV

Range : Pusad, Round : Khandala

Beat : East Khandala

Maker : Shri. S.S. Wankar,

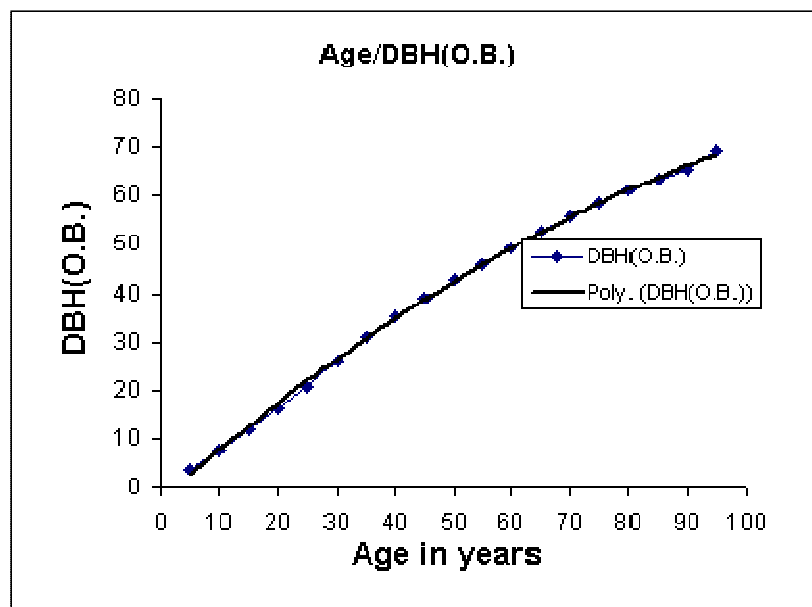
R.F.O.W.P.Yavatmal

Comptt.No.: 400

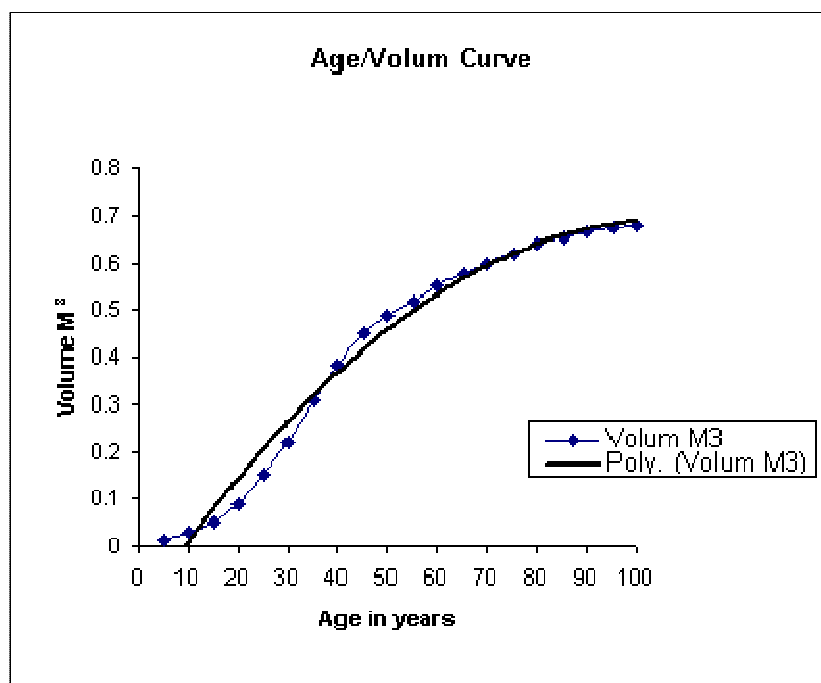
SR. NO.	AGE	GBH(OB)	HEIGHT	VOLUME	CAI	MAI
1	5	3.94	2.1	0.014	0.0028	0.0028
2	10	7.84	3.9	0.030	0.0032	0.0030
3	15	11.7	5.2	0.052	0.0044	0.0034
4	20	16.56	6.8	0.090	0.0076	0.0045
5	25	20.78	7.4	0.150	0.012	0.0060
6	30	25.84	8.4	0.220	0.014	0.0073
7	35	30.86	9.0	0.306	0.017	0.0087
8	40	35.1	9.8	0.384	0.0156	0.0096
9	45	39.14	10.5	0.450	0.013	0.0100
10	50	43.0	11.6	0.490	0.008	0.0098
11	55	46.0	12	0.520	0.006	0.0094
12	60	49.4	12.6	0.550	0.006	0.0091
13	65	52.8	13.6	0.576	0.005	0.0088
14	70	55.8	13.8	0.598	0.0044	0.0085
15	75	58.6	14.4	0.618	0.004	0.0082
16	80	61.2	15.0	0.638	0.004	0.0079
17	85	63.4	15.5	0.654	0.0032	0.0076
18	90	65.6	16.0	0.664	0.002	0.0073
19	95	69.4	16.4	0.674	0.002	0.0070
20	100		16.8	0.680	0.0012	0.0068

Age Girth and Breast Height (Over Bark) Analysis

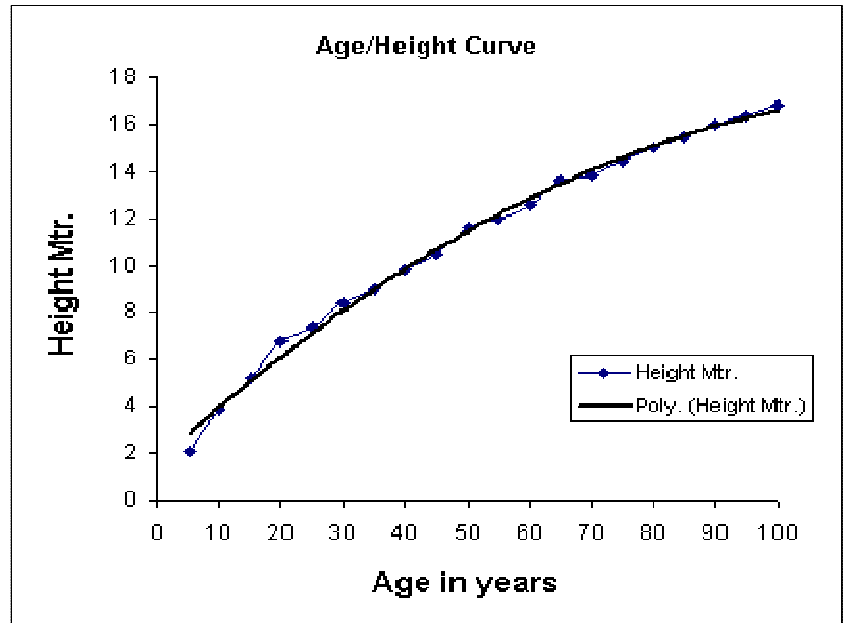
Age in Years	DBH (O.B.)
5	3.94
10	7.84
15	11.7
20	16.56
25	20.78
30	25.84
35	30.86
40	35.1
45	39.14
50	43.0
55	46.0
60	49.4
65	52.8
70	55.8
75	58.6
80	61.2
85	63.4
90	65.6
95	69.4



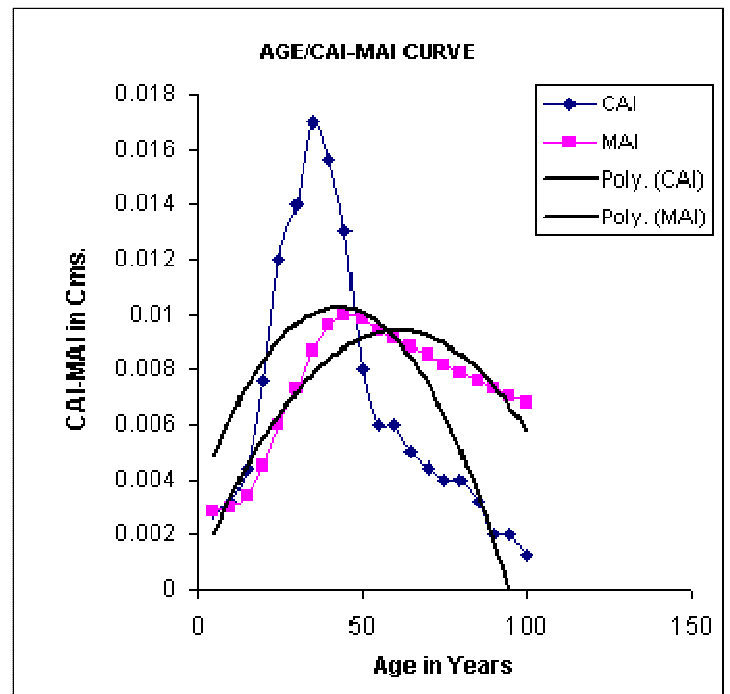
Age in years	Volume
5	0.014
10	0.030
15	0.052
20	0.090
25	0.150
30	0.220
35	0.306
40	0.384
45	0.450
50	0.490
55	0.520
60	0.550
65	0.576
70	0.598
75	0.618
80	0.638
85	0.654
90	0.664
95	0.674
100	0.680



Age in Year	Height Mtr.
5	2.1
10	3.9
15	5.2
20	6.8
25	7.4
30	8.4
35	9.0
40	9.8
45	10.5
50	11.6
55	12
60	12.6
65	13.6
70	13.8
75	14.4
80	15.0
85	15.5
90	16.0
95	16.4
100	16.8



Age	CAI	MAI
5	0.0028	0.0028
10	0.0032	0.0030
15	0.0044	0.0034
20	0.0076	0.0045
25	0.012	0.0060
30	0.014	0.0073
35	0.017	0.0087
40	0.0156	0.0096
45	0.013	0.0100
50	0.008	0.0098
55	0.006	0.0094
60	0.006	0.0091
65	0.005	0.0088
70	0.0044	0.0085
75	0.004	0.0082
80	0.004	0.0079
85	0.0032	0.0076
90	0.002	0.0073
95	0.002	0.0070
100	0.0012	0.0068



SECTION VIII.2 STOCK MAPPING :-

The reserve forest of the division were stock mapped for the 1st time in the year 1915-16 to 1937-38 at the time of revision of working plan by Shri. Malcon. The stock maps were updated from time to time with each revision of the working plan. During the present revision these stock maps have been updated in 2005 and 2006 by carrying out stock mapping of this division by the staff of working plan Yavatmal. The results of stock mapping are given in table no 26. The stocking have also been calculated with the analysis of satellite imagery data of the tract for the year 2004 at Geomatic centre, Office of Chief Conservator of Forests, Working Plan, Nagpur. The Satellite imagery of Liss data was used to classify the patches of the forest according to density reveled in the normalized density vegetation index (NDVI) mapping. The enumeration data of SOFR has been linked with compartment maps in the GIS environment, showing the stocking and management details. The maps prepared in GIS environment are cartographically more accurate than traditional stock maps based on comparison of NDVI maps and manual stock mapping has been fairly standardized in the forest GIS cell Yavatmal.

VIII.2.1 Density Slicing :-

The data of satellite imagery of Pusad forest division for the period of October 2003 has been systematically analyzed in the GIS cell of Chief Conservator of Forests, Working Plan, Nagpur and the results obtained are given below.

TABLE NO -25
Densitywise Distribution of Area

Density	Area in ha.
> 0.6	15313.09
0.4 to 0.6	27807.91
0.1 to 0.4	12429.01
Blank	13885.25
Total	69435.26

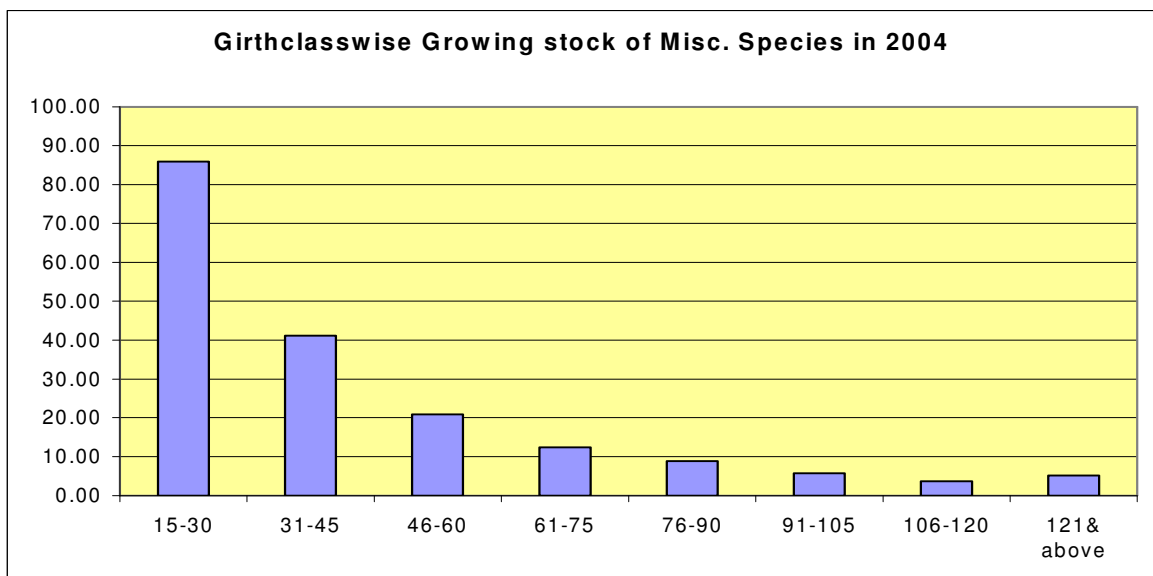
TABLE NO -26

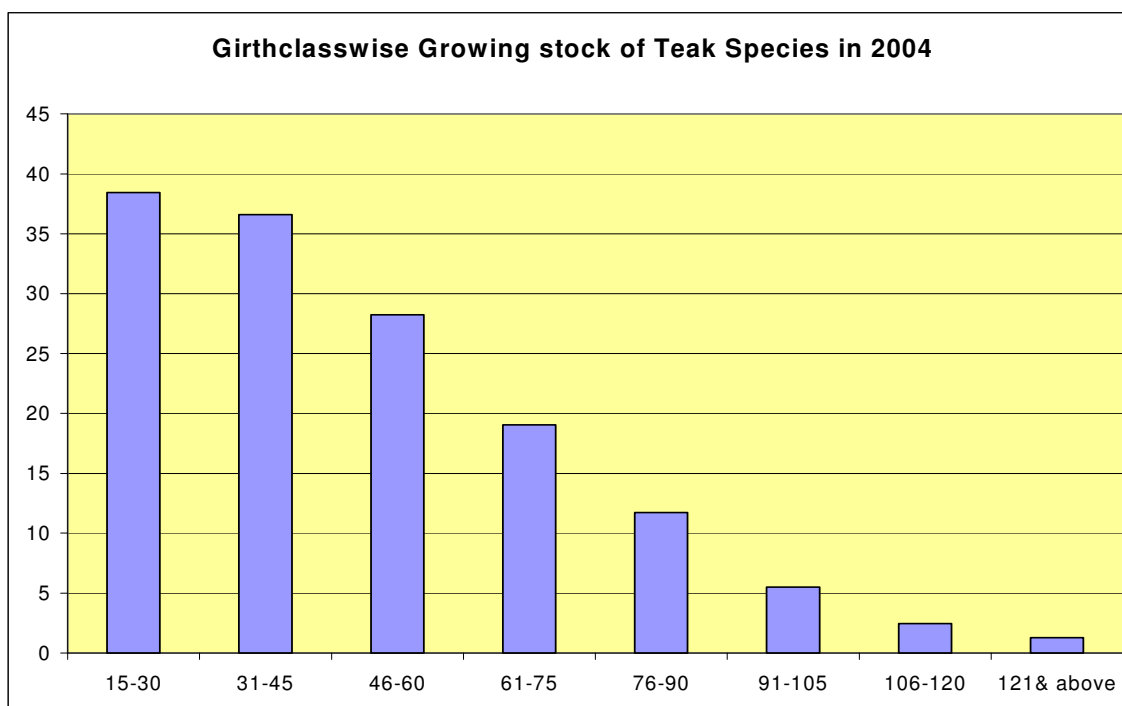
Result of Stockmapping

QUALITY	AREA IN HA.	% AREA WRT WP AREA
IV B Teak	25265.55	36.38
IV B Misc	3672.96	5.28
Plantation	8328.90	12.00
Understock	26666.54	38.40
Blank	3084.34	4.45
Eroded and Scrub	762.88	1.10
Encroachment/ Cultivation	1433.06	2.07
Water Bodies	221.03	0.32
Total	69435.26	100.00

In this division most of the compartments are having forest areas as well as village areas and it is not possible to segregate the agriculture land of the village and forest area under cultivation (encroachment) and the natural blank area.

The statement related to density wise and compartment wise area details have been given in Volume II.





VIII.2.2 Enumeration :-

In the past the enumeration for estimation of stocking used to carry out by the working plan wing. After creation of SOFR units in the states the enumeration of forest was totally entrusted to these units. In Pusad forest division, the enumeration was conducted by the SOFR in 2004.

VIII.2.3 Method of enumeration :-

The sample in design was systematic lying spot survey and the intensity of sampling (1 %). The sample plots are laid down by taking grid of 600 x 600 mtr. in each corner of grid. The sample plot of 60 x 60 mtr for tree enumeration and 20 x 20 mtr plot per shrub enumeration. Apart from tree enumeration the regeneration survey was also carried out by laying out sample plot of 20 x 20 mtr.

VIII.2.4 Analysis of data :-

The enumeration data was analyzed by using the forest inventory management system developed by Shri. J.S.Dabhekar, then Range Forest Officer in the Office of Conservator of Forests, Working Plan, Nagpur by using the software for data feeding and the compartment wise and species wise result was processed in excel sheet in the office of Conservator of Forests, Working Plan, Yavatmal. The total growing stock as per analysis of enumeration data is 327.05 out of which 143.27 teak

and 183.78 misc. The results obtained out of enumeration data analysis of Pusad forest division are given in the following table.

TABLE NO -27

Species	15-30	30-45	45-60	60-75	75-90	90-105	105-120	120-135	Total
1	2	3	4	5	6	7	8	9	11
Teak	38.44	36.59	28.24	19.05	11.72	5.51	2.44	1.28	143.27
Non Teak	85.90	41.14	20.87	12.38	8.86	5.76	3.69	5.18	183.78
G. Total	124.34	77.73	49.11	31.43	20.58	11.27	6.13	6.46	327.05

VIII.3. Results of enumeration during previous plan :-

The SOFR unit Amravati carried out enumeration in the year of 1994. The enumeration was carried out working circlewise and compartment wise and the sampling was 1% systematic sampling.

From the analysis of data it is revealed that the growing stock of the forest reduced in both teak and misc. species in comparison to 1972 enumeration data. The total growing stock as per 1994 enumeration survey is 311.30 per ha. out of which 194.25 is of teak, 117.05 is of misc. species.

VIII.3.1 Enumeration of 1972 :-

During the revision of Thosre's working plan by Shri Pal the enumeration data of 1972 was utilized by Shri. Pal surveyed by unit of resources survey scheme. The unit of forest resources survey scheme carried out enumeration of this division from March to May 1972 and from November 1977 to March 1978 under the guidance of forest statistician of Pune. The intensity of sampling was 8.91 % in Painganga SCI working circle and 2.42 % in CWR working circle. The total growing stock in Painganga SCI working circle was 470 trees per ha. out of which teak constituted 213 per ha. i.e. approximately 45.18 % per ha. The species of general utility was 247 trees per ha. The distribution of teak and misc. species in various girth classes per ha. is given in the following table.

TABLE NO -28

Species	15-30	30-45	45-60	60-75	75-90	90-105	105-120	120-135	Total
1	2	3	4	5	6	7	8	9	11
Teak	108.18	67.14	35.30	18.36	9.05	8.71	0.90	0.70	248.34
Non Teak	81.98	56.57	27.71	15.62	9.06	9.43	3.12	4.62	208.11
Total	190.16	123.71	63.01	33.98	18.11	18.14	4.02	5.32	456.45

In coppice with reserve working circle the total number of trees enumerated was 509 out of which teak constituted 221 per ha. i.e. 43.5% of growing stock.

VIII.3.2 Changes in growing stock :-

TABLE NO -29

Girth Class	Yearwise Enumeration data number of trees per ha.			Difference in growing stock		
	1972	1994	2004	1972&1994	1972&2004	1994 & 2004
15/30	190.16	99.70	124.34	90.46	65.82	-24.64
31/45	123.71	87.35	77.73	36.36	45.98	9.62
46/60	63.01	55.12	49.11	7.89	13.90	6.01
61/75	33.98	41.49	31.43	-7.51	2.55	10.06
76/90	18.11	11.41	20.58	6.70	-2.74	-9.17
91/105	18.14	8.91	11.27	9.23	6.87	-2.36
106/120	4.02	4.04	6.13	-0.02	-2.11	-2.09
121&Above	5.32	3.28	6.46	2.04	-3.25	-3.18
Total	456.45	311.30	327.05	145.15	129.40	-15.75

VIII.3.3 Comparison of growing stock between 1972 and 1994 :-

On comparison of growing stock of 1972 with 1994 the following inferences can be done.

1. The over all growing stock in 1972 was 456.45 whereas in 1994 it is 311.30 which clearly indicates there was drastic degradation in the stocking of the forests.
2. The substantial reduction in the growing stock taken place in the lower girth classes especially in 15/30 and 31/45.
3. There is substantial reduction growing stock of teak in 1994 when compared to enumeration data of 1972. Especially in 15/30 girth class, marginal decrease in 31/45 girth class and 91/105 girth class. Whereas marginal increase in teak growing stock can be noticed in 46/60, 61/75, 76/90 and 106/120.
4. In case of misc. reduction in growing stock in 31/45, 46/60, 61/75, 7/90, 91/105 girth classes where as marginal increase as per 1994 data in girth classes 15/30, 106/120 and 121 & above

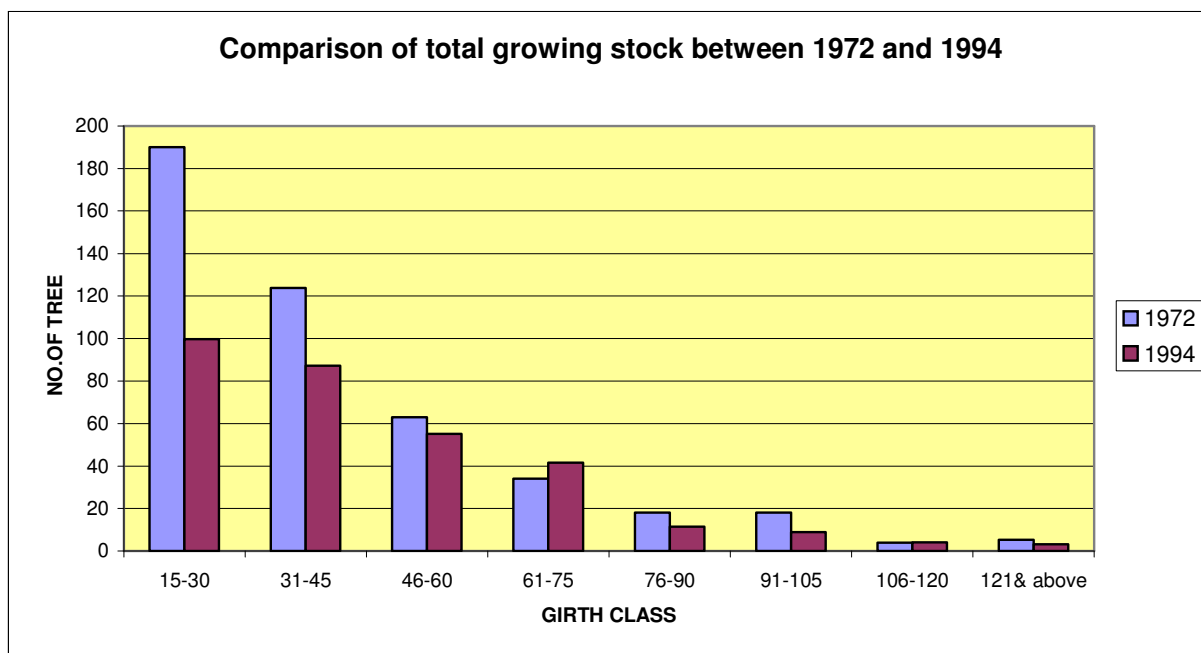
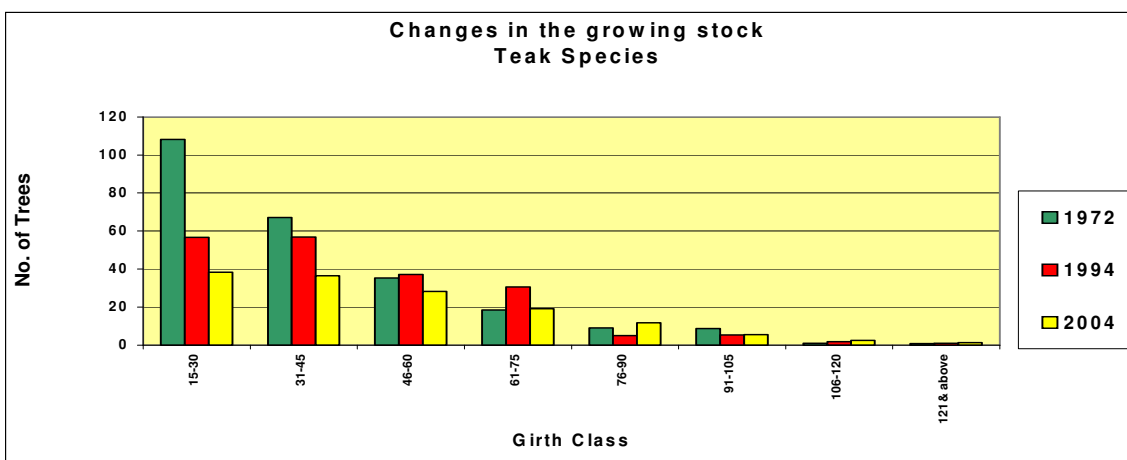
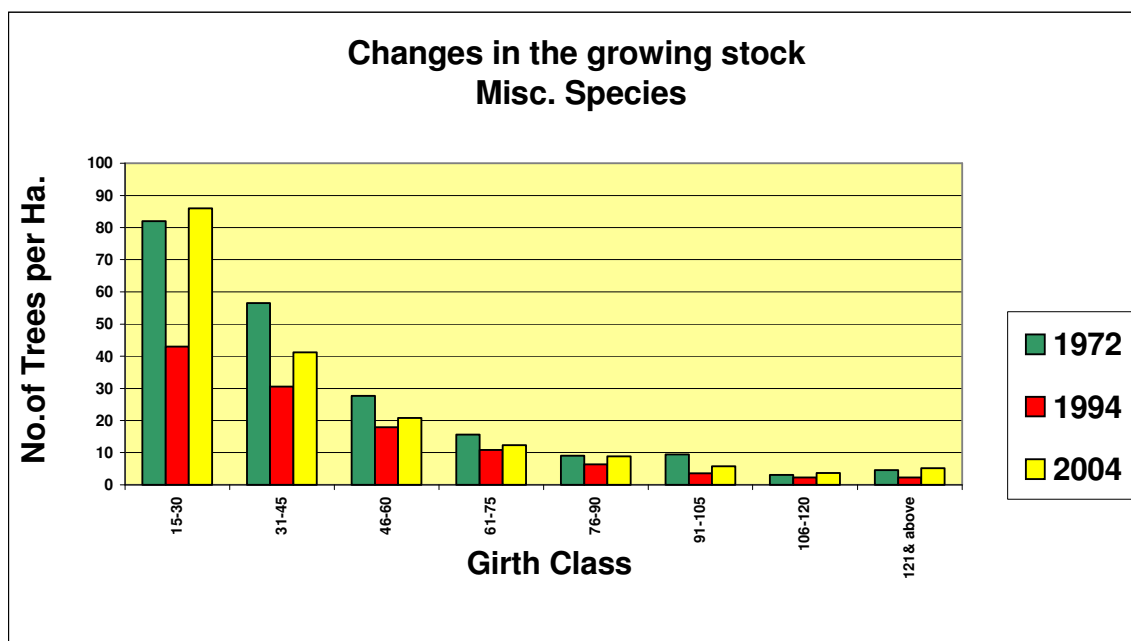
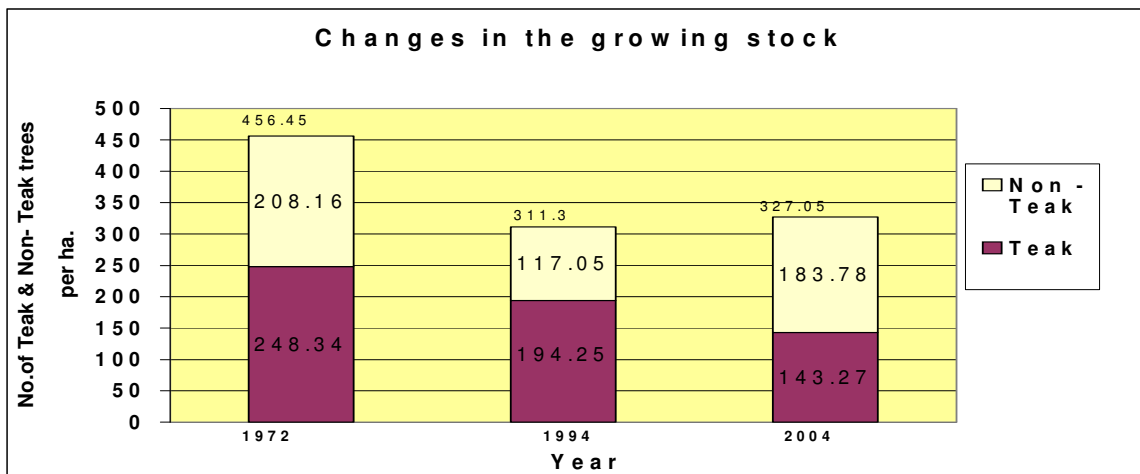


TABLE NO -30

Number of Teak Trees per Ha.			
Girth Class	Number of Trees		
	1972	1994	2004
15-30	108.18	56.66	38.44
31-45	67.14	56.82	36.59
46-60	35.30	37.18	28.24
61-75	18.36	30.57	19.05
76-90	9.05	5.00	11.72
91-105	8.71	5.30	5.51
106-120	0.90	1.73	2.44
121& above	0.70	0.99	1.28



Number of Misc. Trees per Ha.			
Girth Class	Number of Trees		
	1972	1994	2004
15-30	81.98	43.04	85.90
31-45	56.57	30.53	41.14
46-60	27.71	17.94	20.87
61-75	15.62	10.92	12.38
76-90	9.06	6.41	8.86
91-105	9.43	3.61	5.76
106-120	3.12	2.31	3.69
121& above	4.62	2.29	5.18



VIII.3.4 Comparison between the results of enumeration data of 1994 and 2004

1. In 1994 the total growing stock per ha. nearby 311.30 and out of which teak constituted 194.25 i.e. 62.40 % of total growing stock.
2. The enumeration data of 2004 reveals that the total growing stock is 327.05 out of which teak constitutes 143.27 i.e. 43.81% total growing stock.

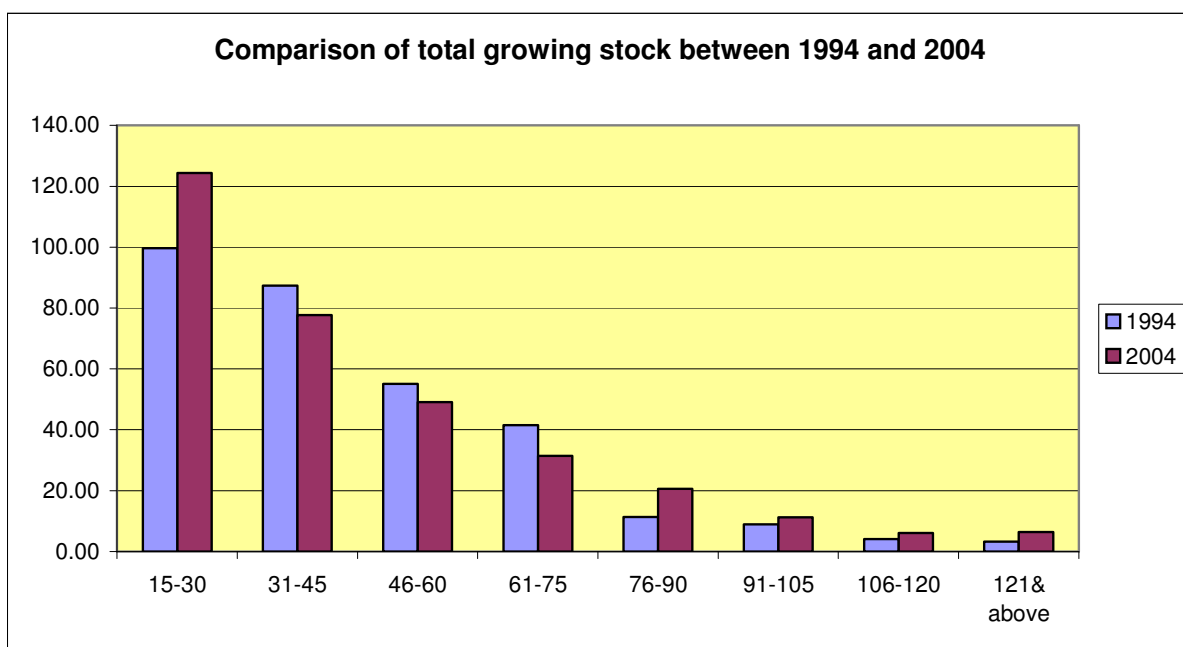


TABLE NO -31

Name of Species	15-30	30-45	45-60	60-75	75-90	90-105	105-120	120-135	Total
1	2	3	4	5	6	7	8	9	11
Teak	56.66	56.82	37.18	30.57	5.00	5.30	1.73	0.99	194.25
Non Teak	43.04	30.53	17.94	10.92	6.41	3.61	2.31	2.29	117.05
Total	99.70	87.35	55.12	41.49	11.41	8.91	4.04	3.28	311.30

The comparison of enumeration data of 2004 with 1994 indicates.

1. There is marginal increase in overall growing stock i.e. 15.75 per ha.
2. The growing stock of teak has come down when compared to misc. in 2004.
3. It is interesting to note that the growing stock of misc. species increased when compared to percentage of growing stock of teak as per the enumeration data of 1972 and 1994.

4. There is reduction in growing stock in 31/45, 46/60, 61/75 girth classes where as marginal increase in 15/30, 76/90, 106/120, 120 & above in 2004 when compared to 1994.
5. In case of teak there is substantial reduction in 15/30, 31/45, 46/60, 61/75 girth classes and marginal reduction in 76/90 whereas marginal increase can be noticed in 91/105, 106/120, 120 and above in 2004.
6. In case of misc. species substantial increase is noticed in 15/30, 31/45 and marginal increase in all other girth classes.

The comparison of enumeration data of 1972, 1994 and 2004 reveals that there is over all degradation of the forest has taken place.

1. The total growing stock as per 1972 enumeration data was 456.45 Whereas in 1994 it is 311.30 per ha and in 2004 it is 327.05.
2. In 1972 the proportion of teak i.e. 248.34 per ha. is more than misc. (208.11 per ha.)
3. In 1994 the proportion of teak was also more than misc. (194.25 per ha.) whereas 2004 data reveals the proportion of teak (143.27 per ha.) when compared to misc. species 183.78 per ha. which indicates that the increase of misc. species mainly because of non exploitation of misc. species as per the prescription of working plan and other management interventions.

CHAPTER NO. IX

WILD LIFE PRESERVATION

SECTION IX.1. WILD LIFE PRESERVATION

IX.1.1 History and Wild Life protection: -

The forest of Pusad division has been a natural habitat for a variety of wild animals. The forests are mainly Teak bearing along with its associates of misc. species, which forms dense patches of forests specially along with the river Painganga. Therefore the concentration wild life has been mostly in this forest though they are present throughout the division. The history of wild life indicates a good variety of wild life present in habitat in this tract but due to indiscriminate shooting, poaching and shikar by poachers the wild life in this tract is dwindling declining at alarming rate. Other important factors for dwindling of wild life are liberal issue of crop protection license, Poisoning and various development activities that have been under implementation in this area.

IX.1.2 Distribution of Wild Life :-

The fauna was very well distributed in the areas of dense forest specially adjoining to rivers. The wild animals were frequently found in the past and rarely present in this area are as follows

- (A) **Mammals:-Panther** (*Panthera pardus*). **Hyaena** (*Hyaena hyaena*) Jackal (*Canis aureus*). **Indian fox** (*Vulpes bengalensis*). **Jungle cat** (*Felis chaus*) are common among the carnivores and Black buck (*Antelope cervicapra*), **spotted deer** (*Axis axis*), **Blue bull** (*Boselaphus tragocamelus*) sloth bear (*Melursus ursinus*) Wild boar (*Sus scrofa*), common langur (*Presbytis pileatus*) and Indian hare (*Lepus nigricollis*) among the herbivores.
- (B) **Birds:-** The area supports rich avi-fauna. Apart from common birds Pea fowl (*Pavo cristatus*). Grey Jungle fowl (*Gallus sonneratii*), Painted partridge (*Francolinus pictus*), common quail (*Coturnix coturnix*) and crow pheasant (*Centropus sinensis*) have been regularly sighted in the forest areas.
- (C) **Reptiles:-** Red sand boa (*Eryx conicus*), Indian cobra(*Naja naja*), Python (*Python molurus*), Rat snake(*Ptyas mucosus*), Varanus sp, Chameleon sp.

Fish:-Catla (*Catla catla*),Rohu (*Labio rhoita*), Carp (*Cyprinus carpio*),

IX.1.3 : General history of Management :-

It was stated in Berar gazette of 1870 that Tigers & panthers were numerous in the area and it was dangerous to travel in Yavatmal district. Prior to reorganization of state the wild life conservation was ensured under the provisions of Indian Forest Act 1927. The shooting rules were framed by the Government and detailed in the appendix of C.P. and Berar manual vol. 2, combined with Wild Birds and Animal Protection act 1912. The Conservator of Forests in consultation with Divisional Forest Officer used to declare certain blocks of Reserve Forest as open for shooting. Then the shooting permits were issued by the Divisional Forest officer.

In 1952 the Indian Board for wild life was constituted with an objects of devising methods and means for the conservation of wild life through coordinated legislative and practical method. Subsequently the Bombay Wild Animals and Wild Birds protection Act 1951 was enacted and it was consider as the most comprehensive legislation which was made applicable to Vidhrbha region in 1961. This act did not propose any significant changes in the management of the game, however it was important as its provisions allowed to operate even in the areas out side the reserve forests. As per the provisions laid down in this act the arms license holders had to register them selves with the wild life preservation officer. The hunting license was categorised into 4 kinds i.e.1. Small game, 2.Big game, 3.Special Big game and 4.Pet animals. The provisions of this act did not allow to carry any trade in wild life trophies without a separate trophy dealer license. For the purpose of hunting the forest division was divided into 20 shooting blocks.

TABLE NO - 32
NAME OF THE SHOOTING BLOCKS

Sr. No.	Range	Shooting blocks
1	Digras	Injani, Kali
2	Pusad	Urdu, Manjar, Jawla, Warwadi, Gahuli, Amdari, Phetri and Kadoli.
3	Umarkhed	Fulsawangi, Warun, Ganganal.
4	Bittergaon	Chikhali
5	Kharbi	Sondabhi, Kharbi, Korat
6	Arni	Lonbehal, Anjankhed, Nidha.
7	Darwha	Shabaspur, Sonkhas.

SECTION IX.2. SHOOTING AND GAME :-

IX.2.1 For the purpose of shooting the wild animals were classified into 2 categories

1) **Big game :-** I) Tiger (*Panthera tigris*, **Wagh or Sher**). It was usually confined to remote hilly terrain and dense forest. These animals prefer shelter in valleys and water courses for rest. The number was very less in the division mostly these animals concentrated in Kinwat, Karhad, Gondwakdi, Tipeshwar, Kharoni, Girjpur & Bhimkund reserve. From Kinwat reserve and Mahur of Kinwat Range of Nanded division, occasionally cross the Painganga River and enter this division.

II) **Panther :-** (*Panthera pardus*) These were fairly numerous when compared to Tiger population having a wide range of habitation and were frequently seen in Kinwat, Pathrot, Marwadi, Sonkhas & Ghui reserve Forests.

III) Nilgai (*Bosilaphus Tragocamilus*) :- These animals are common generally found in large number distributed in all the regions of the division mostly concentrated in open area.

IV) Sambar (Cervus unicolor):- These are found in small number mostly in dense forest of Kharbi reserve usually sighted in single or pairs but seldom in heard.

V) Chinkara (Indian Gazella) (Gazella Gazella) :- These are found in large number distributed all over the division mostly found on dry hilly sides and scrub forests.

VI) **Spotted deer** (Chital) (**Axis Axis**): - These animals mainly found in Bittergaon and Kharbi reserve and are occasionally sighted else were in the division.

VII) Black Buck (Kalvit, Antelope cervicapra) :- These are very rare animals in the division and are noticeable only in Kharoni.

VIII) Sloath Bear (Melursus Arsinus) :- These are rare and confined to cool and sheltered places, particularly found in forests in Bittergaon Range.

IX) Indian Wild Boar (**Ran-dukkar**) (Sus corfa) :- The populations of these animals mainly concentrated in Kharbi and Bitergaon forests and are occasionally noticed in else were in the division.

X) Wild Dogs (Duon alpinus) :- These animals move in packs forests and do considerable damage to wild animals. Mostly these animals concentrate in Marwadi and Bitergaon Ranges.

2) **Small game** :- Squirrels, **Jackal**, Hyena Hyena, Common Langoor all over the tract. The other small game found in division consist of the following birds.

I) Peafowl (Pavo cristatus), Blue rock peagion (Clumbia Livia), Gray partridge (Titar : Fraucolinus pandicherianus), Painted patridge (Francolinus pictus), Common quail (Coturnix Coturnix) and crow pheasant (centropus sineusis).

IX.2.2 Legal Position: -

The forest area of this division was a part and parced of C.P.& Berar State. The provisions in Berar forest law in 1886 were passed on Oct. 22nd 1886. There was no separate act regarding protection of Wild life in vogue at that time. It was, under Sec. 3, Sub rule (7), the defirmination of the forest produce included “Skins, tusks, bones &

Horns”. Under Sec. 8 of the said act “any person who acts in contravention of the said act in the state forests was punishable with the fine which may go up to Rs.50/- when the damage resulting from his offence amounts to more than Rs.25/- , to double the amount of such damage” “Under Sec.10, Sub Sec (4) of the said act the residency by orders may regulate any part of the state forest for the hunting, shooting, fishing, poisoning of water or setting trap or snares”. The Berar law of 1886 was amended by the Berar forest law of 1891. The scope of the act was extended. The sec 7 (b) clearly states that forest produce including the following found in, brought from a forest i.e. to say wild animals, Skins, tusks, Horns, Bones, Cocoons, Honey, Wax and all other parts or produce of animals or forest produce. Sec. 7(2) (B) states that punishable with the fine which may extend upto Rs.50/- or when the damages resulting from the offence amounts to more than Rs.25/- to double the amount of such damage.

SECTION IX 2.3 :-

Empowered the resident to frame the rules in relation to regulation of hunting, shooting, fishing, poisoning of water and setting traps and snares. In the year 1911 vide notification no/GIFD/2197-1-B; Dt. Oct 30th 1878 was made applicable. The definition of Wild life as forest produce was included under sec 2 (B)(III). Under sec. 25 (1) of the said act, that any person in contravention of any rules made under this act, which local Govt. may from time to time prescribed, Kills or catches elephants hunts or shoots fishes, poisons water or sets traps shall be punishable with imprisonment for a term which may extend to 6 months or with the fine not exceeding Rs.500/- or in both in addition to compensation for the damage done to the forests.

After the enactment of Indian Forest Act 1927, rules related to wild life regulations were framed under sec. 26 (1), 76 (d) which was essential to regulate hunting of wild animals and were given in the appendix VIII of M.P. forest manual volume 2.

Wild Birds and Animal Protection act 1912 as amended in 1935 also ensured protection to certain animals and a check of hunting of animals. Shooting block system was initiated in the year of 1947 under the provisions of these 2 acts. The Conservator of Forests in consultation with the Divisional Forest Officer concerned used

to declared the areas having abundant game as open to hunting and the Divisional Forest Officer accordingly issued shooting permits were in the type of game and the number allowed to be hunted together with, the other relevant conditions.

The Bombay Wild Animals and Wild Bird protection act 1951 the protection of wild animals was extended to Vidarbha region, which has enhanced the scope of management of game out side Reserve, and Protected Forest also. Under the provisions of this act regulations were made for registration of armed license holders, categorization of game into small game, big game, special big game and pet animals and also regulated transaction in trophies and other wild life products. Under this act the statutory wild life advisory board was constituted in order to advice the Government on various important matters regarding wild animals. In 1952 the Indian Board of wild life was constituted with the main object of devising ways and means for conservation wild life through coordinated approach of legislative and political measures and sponsoring the measures to reconstitute National Parks and Wild Life Sanctuary. The comprehensive and unified National & State Park act of 1971 was passed to provide for appointment of any advisory committee to advise in continuation and declaration of National Parks and Sanctuary and formulation of administrative policy.

In 1972 the parliament enacted the wild Life (Protection) Act 1972 which came into force in the state since 1st of June 1973, and superseded all other acts related to Wild Life Protection and management in the state. The subsequent rules were made under the act are as follows.

1. The Wild Life (Stock declaration) rules 1973. (came in force in the state since 1st of June 1973)
2. The Wild Life (Transactions and Taxidermy) rules 1973 (came in existence since 1st June 1973).
3. The Wild Life (Protection) rules 1975 (came in force since 6th March 1975).
4. The Wild Life (Protection), licensing (additional matter consideration) rules 1983 became effective since 14th April 1983.

The Wild Life (Protection) Act is a comprehensive legislation that facilitates for effective protection and preservation of Wild Life, more over it enabled restrictions on hunting and regulation of trade in Wild Animals as well as the articles made out of Wild Animals.

Hunting of Wild Animals, strictly prohibited unless specially permitted as per laid down procedure. Under this act wild animals have been categorized into V schedules and those animals which are included in scheduled I, II and III received the privilege stringent protection.

The Wild Animals included in the scheduled or permitted to eliminate if they became threat to or cause damage to life or property and the animals included in scheduled II have become disabled completely or deceased beyond recovery. Whereas, only vermin included in scheduled V were excluded from strict protection.

Hunting of young and female of any wild animals other than vermin is strictly prohibited unless permitted (Sec. 15). The persons who possess any wild animals trophies are required to declare in a specified proforma under the provisions of this act. The Government of India specified vide letter Dt. 18th Sept 1975 that the management authorities are vested with the control over the tanks and rivers in National Parks and Sanctuaries.

The delegation of powers and duties of the Chief Wild Life Warden to the Police Sub Inspector for the purpose of Sec. 41 (1) and sec. 55 of the Wild Life (Protection) Act 1972 was granted by G.R. No. WLP-1973/197578 –F-1, Dt. 5th April 1976. The schedules are revised by the Government from time to time as it was required under Sec. 61 of the Wild Life (Protection) Act 1972. The Government of Maharashtra framed rules under sec. 64 of Wild Life (Protection) Act 1972 vide its letter no. WLP-1679/95507 / F-5.

The Wild Life (Protection) Act was again amended herein after called as Wild Life (Protection) amendment act 1986 and became effective since 25th November 1986. Under sec. 44 of the Wild Life (Protection) Act 1972 the Government vide letter

No/WLP/1682/100208/CR-43(1)/F-5 permitted the trapping of Cobra and Russell vipers by a licensed dealer for the purpose of extracting venom. Under the power conferred under sub sec. (1) and sub section (2) of the section 64, the Government of India vide letter no. WLP/1682/10020 (iii)/F-5 framed the new rules called Wild Life (Frog Leg Industry) Rules 1987 and it came into force from November 25, 1987. The Government of India vide letter no. F. no. 1-2/91/WL/I, Dt. October 21, 1991 and further amended the Wild Life (Protection) Act 1972. Subsequently Wild Plants, have been brought under the provisions of this act. The zoo and circus have been defined and included in this act whereas the game reserves have been completely dropped. A total ban has been imposed on hunting of wild animals specified in scheduled II, III, IV and I except as provided under Section 11 and 12 by amending section 9 of Wild Life (Protection) Act 1972.

In 2003 compressive amendment was made to impose heavy penalty and stringent punishment in case of Wild Life offences. Under the provisions of section 17 of Wild Life (Protection) act the following acts are prohibited.

1. Hunting of Wild Animals from or by means of wheeled or mechanically propelled vehicles in water or on land or by air craft.
2. Use of mechanically propelled vehicles for the purpose of stampeding any wild animals.
3. Use of chemicals, explosives, pit falls, poisons, poisoned weapons, snares or traps except related to capture of wild animals under wild animal trapping license.
4. Hunting of special game or big game other than with a Rifle unless specially authorized by the licensee.
5. Setting fire to vegetation for the purpose of hunting, using artificial light for the purpose of hunting except when specially authorized to do so under license in the case of carnivore over a kill. Hunting during night time except when specially authorized.

6. Hunting of any animals on water whole or a salt-lick or other drinking places or on path or approaches to the path except water birds or sand goose
7. Hunting of any wild animals on any land not owned by the Government without the consent of the owner or his agent.
8. Hunting during closed period under section 16.
9. Hunting with the help of dogs, any wild animals except water bird, partridge or quail.
10. The Government of Indian has passed Wild Life (Protection) amendment act 1991 with effect from October 2nd 1991 except the section 35, 44, 55(c) chapter III A, IV A. The main features of this amended act are given below.
 - i. The words “game reserve”, “big game” and “small game” have been deleted from the act. Hunting of Wild Animals included in scheduled I, II, III and IV of the act has been prohibited except as per the provisions of section 11. Specified plants have been included in a new scheduled for the protection of the same by introducing chapter 3 A.
 - ii. The section 29 has been amended which prohibit any exploitations in National Parks and Sanctuaries.
 - iii. A new section has been added in the act to provide that no new armed license have been issued within the 10 KM of Sanctuary without prior permission of the Chief Wild Life Warden of the state.
 - iv. Imposed ban on dealing with imported ivory and articles made there from.
 - v. Introducing new chapter IV A for Central Zoo authority and recognition of Zoos.

- vi. The penalties to related to wild life offences have been enhanced substantially. Section 39 of the act has been amended to the effect that have been used for committing an offence and have been seized shall become the property of Government.
- vii. Section 61 (1) of the act has been amended which provides the power to make any change in the schedules of the act vests only with the Central Government.

SECTION IX . 4 : RIGHTS AND CONCENSSIONS

No rights and concessions or privileges are granted to any person over wild life except a person of Scheduled Tribes can pick up or collect or possess in the district in which he resides any specified plants or plant derivatives thereof for his bonafied personal use subject to the provisions of chapter IV of Wild Life (Protection) Act. The Chief Wild Life Warden can grant the permits with prior approval of the State Government for special purposes of education, scientific research and collection of specimen for recognized zoos, Museums and Scientific institutions.

SECTION IX . 5: OTHER METHODS ADOPTED FOR PROTECTING WILD LIFE :-

Apart from legal methods under the Wild Life (Protection) Act 1972 the following measures have been introduced to protect wild life from time to time.

Payment of compensation to the owner whose cattle are killed by Tiger in the forest areas as per the G.R. No. WLP/1570/224482- X-11, dt. September 30, 1971, No.MSC-1075/113554/F-1, Dt. March 25, 1977 and No. WLP/1579/6200/4/F-1, Dt. May 29, 1979. This provision was extended to the cattle killed by the Panther also and the killing by Tiger or Panther outside the forest areas was also included vide G.R. No.WLP/1581/ 11697/F-5, Dt. August 22, 1984.

Compensation is declared in case of death or injury to human life caused by wild animals vide G.R. No. WLP/1679/105651/CR-6/F-5, Dt. November 27, 1986 and amended from time to time and the latest revised in 2003. Maximum amount of compensation in case of major injury upto Rs.50,000/- and for minor injury upto Rs.7500/-.

The State Government have introduced Grant of Reward to the informants in respect of unlicensed shooting provided that the information found to valid and leads to the conviction of offender in order to check illegal shooting of wild animals. Besides the State Government have decided to sanctioned rewards equal to 50% compensation actually recovered from the offender for illegal shooting to the Grampanchyat and its office bears or individuals who render co-operation in detecting such illegal shooting.

Creation of public awareness for protection and preservation of wild life through various programmes under Wild Life Week.

Details of cattle lifting injuries or killing of human beings along with compensation paid to the victim families are given in the plan.

TABLE NO - 33
WILD LIFE COMPENSATION

Sr. No.	Year	No. of persons attacked by Wild Animals	Amount of Compensation
1	1997-1998	2	41463
2	1998-1999	9	13500
3	1999-2000	2	4000
4	2000-2001	2	27000
5	2001-2002	4	22858
6	2002-2003	4	59270
7	2003-2004	1	2978
8	2004-2005	13	243190

SECTION IX . 6 :- INJURIES TO WHICH THE WILD LIFE IS LIABLE :-

Poaching is one of the main factors for the destruction of wild life in Pusad division. Destruction of habitat due to illicit felling, fragmentation of area, frequent fires and encroachments for cultivation have been affecting the wild animal population adversely.

Reduction in a forest cover, erratic rainfall resulted in non availability of water inside the forest specially in summer have led to the dwindling of population of wild animal over the years.

Electruction is a common method for hunting of wild animals. The table in which indicates the poaching of wild animals from 2000 to 2005 – 06 is given below.

TABLE NO - 34

STATEMENT SHOWING THE NUMBER OF ANIMALS CAPTURED, HUNTED OR NATURALLY DEAD SINCE 1998-99										
Year	No.of Cases	POACHING			NATURAL DEATH			ACCIDENTIAL		
		Tiger	Panther	Other	Tiger	Panther	Other	Tiger	Panther	Other
1	2	3	4	5	6	7	8	9	10	11
1997-1998	Nil	--	--	--	--	--	--	--	--	--
1998-1999	Nil	--	--	--	--	--	--	--	--	--
1999-2000	6	--	--	1	--	1	3	1	--	--
2000-2001	6	--	--	1	--	1	3	--	--	1
2001-2002	5	--	--	--	--	4	--	1	--	--
2002-2003	1	--	--	--	--	--	--	--	--	1
2003-2004	0	0	0	0	0	0	0	0	0	0
2004-2005	0	0	0	0	0	0	0	0	0	0
2005-2006	1	0	1	0	0	0	0	0	0	0

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PART - II

FUTURE MANAGEMENT DISCUSSED AND PRESCRIBED

CHAPTER - I

BASIS FOR PROPOSAL

SECTION I.1 : NATIONAL FOREST POLICY :-

National forest policy for India was 1st enacted in 1894. This policy considered public benefit as the main objective of public forest management. It suggested the maintenance of Forests in hilly areas for preservation of climatic conditions and protection of agriculture from hill torrents. The objectives of the forest policy 1894 here

- a. To preserve climatic and physical conditions of the country.
- b. To preserve minimum amount of forest necessary for general well being of the country.

The other priorities of 1894 forest policy were -

1. Priority to cultivation over forestry.
2. To meet the public demand for Forest produce at concessional rates on priority in comparison to revenue consideration.
3. Realization of maximum revenue after meeting the demands of local people.

National Forest Policy 1952 :-

Indian republic formulated its 1st National Forest Policy in 1952. The factors that influenced the policy makers were.

Detonating environmental conditions, 2. World wars, 3. Dependency of defence on forest produce, 4. Reconstruction schemes on forestry.

The following needs were identified while making forest policy.

1. The need for evolving a system of balanced and complimentary land use.
2. Need for checking of denudation and mountaineous regions, erosion along the tree less banks of great rivers and on vast undulating waste lands.
3. Need for establishing tree lands, to ameliorate physical and climatic conditions for general well being of the people.

4. The need for progressively increasing demands for grazing, fire wood, and small timber for agriculture implements.
5. The need for realization of revenue in continuity.

The National Forest Policy 1952 stated that the State Government to regulate, frame the policies for forest administration and legislation for conservation and utilization of forest resources, Provided those policies do not adversely affect the general economy and physical balance of adjoining States and in general the Forest Policy of the Central Government.

SECTION I.2 : NATIONAL FOREST POLICY 1988.

The forest have been brought to the concurrent list from the state list with the effect of 42nd amendment to the constitution of India which enable the central Government to exercise more authority in forestry matters. This was clearly reflected in the National Forest Policy 1988. The reasons for such changes were, inadequacy of protection measures, diversion of forest lands to non forestry uses, tendency to maximum revenue realization, growing demands for timber, wood and fodder. The Forest policy of 1988 clearly states that the forests are to be managed mainly for preservation, maintenance, sustainable utilization, restoration and enhancement of natural environments. The governing objects of National Forest Policy are as follows.

1. Maintenance of environmental equilibrium through preservation and restoration of ecological balance.
2. Conserving national heritage by preserving the remain natural forests with the great variety of Flora and fauna which represents commendable biodiversity and genetic resources of the country.
3. Checking soil erosion and desiltation in the catchment areas of rivers, lakes, reservoirs through soil and water conservation measures in order to mitigate floods, droughts and siltation of reservoirs.

4. Substantial improvement in the forests and tree cover in the country through massive afforestation, Social Forestry programmes specially on denuded, degraded and unproductive lands.
5. Meeting the demands for fuel wood, minor forest produce, fodder and small timber of the rural and tribal populations.
6. Increase the productivity of forest to meet essential needs of the nation.
7. Efficient utilization of forests produce by introducing modern techniques and maximum substitution of wood.
8. Ensuring massive peoples movement by creating awareness and involvement of all women for achieving these objects and to minimize the dependency on existing forests.
9. The basic emphasis of the policy is on the management of existing forests and forest lands by protecting and increasing their productivity and conservation of total biological diversity by strengthening and improving network of national parks, sanctuaries, biosphere reserves and other protected areas.

The objects of 1988 Forest Policy are as follows :-

1. Restrictions on schemes and projects which interfere with the forest that cover steep slopes, catchment of rivers, lakes and reservoirs.
2. No working of forests without approval of management plans by the Central Government.
3. Exotic species are not to be introduced without long term scientific trails.
4. The rights and concessions including in grazing regulated by carrying capacity of the forests.

5. The rights and concessions for forest produce of the tribal should be protected and their domestic needs for fuel, fodder, non wood forest produce and small timber for construction should be provided on priority.
6. Forest management plans to take special care about wild life conservation.
7. Effective action to prevent encroachment on forest land the existing encroachments should not be regularised.
8. Forest based industries should raise their raw material needed by them, making arrangement from private cultivators without depending on forests.
9. Survey of Forest resources shall be completed on scientific lines for updating information.

SECTION I.3 :- NATIONAL FORESTRY ACTION PROGRAMME :-

The Government of India Have formulated National Forestry Action Plan in order to reverse the process of degradation of forests and for sustainable development of forests. It is a compressive strategic plan to address major problems of the forestry sector. The major thrust of National Forestry Action programme to enhance the contribution of Forestry and tree resources for ecological stability and people centered development through qualitative and quantitative improvement in forest resources.

The identified issues in forestry sector :-

The aim of the National Forestry Action Programme is to evolve issue based programme on the lines of provisions of National Forestry Policy 1988. It is to integrate forestry development programme in the country within the frame work of National five years plans. Under National Forestry Action Programme five inter-related basic issues have been identified and these are the basis of the following programme structure.

The programme targets the rehabilitation and increase in productivity of the degraded forests and enhance in the areas of forest and tree cover to the extent of 33% of the total area of the country within 20 years. The five inter related issues identified and to be addressed in the programme are

- i. Protect existing forest resources.
- ii. Improve forest productivity.
- iii. Reduce total demand.
- iv. Strength policy and institutional frame work.
- v. Expand forest area.

Programme :-

i. Protect existing forest resources :- It has three mains of sub programmes.

1. Forest Protection, 2. Soil and water conservation, 3. Protected areas and biodiversity conservation.

These sub programmes include the works of forest survey, demarcation mapping, inventory, bio-diversity conservation, protected area management, stringent protection against encroachment, fires, poaching, etc.

ii. Improve Forest Productivity :- The main sub programme identified are

1. Rehabilitation of degraded forests, 2. Research and Technology development 3. Development of NWFP, 4. Assisting private individuals with community participation.

These Sub programme involve main aspects of research and enrichment of planting stock, soil and water conservation, technology improvement, regeneration, rehabilitation and afforestation mainly in existing forest.

iii. Reduce total demand :- The main sub programmes for the efficient usage of 1. Fuel wood and fodder, 2. Timber, 3. NWFP.

The main aspects include in this programme technology improvement in preservation, seasoning, substitutions and other measures or efficient utilization of forest products, reduction in wastage of forest produce and also through extensive biomass plantations.

iv. Strengthen policy and institutional frame work :- The sub programmes are **1.** Central Forests Administration, **2.** Central Forestry institutions, **3.** State Forestry administration and institutions.

These sub programmes include development of infrastructure facilities like Buildings, Communication etc and Strengthen of skills of staff including Human Resources Development. These issues cover all the aspects of capacity building forest policy and litigation, public forest administration and organizational structure, research, planning and budgeting etc.

v. Expand the forest area :- The two sub programmes are **1.** Tree plantation on forest and outside forest lands, **2.** Peoples participation in plantation and its protection.

The aspects of extensive forestry programme in all kinds of waste lands and marginal farm lands through creation of plantation forest by taking up waste land reclamation, afforestation, promotion of agro forestry.

The basic objective of National Forestry Action Programme :-

The objective of National Forest Action Programme are as follows

1. To achieve sustainability of the forest, productivity of forest plantations to be enhanced at least 3 to 5 cubic meter per ha, per annum, by regeneration and enrichment plantations.
2. Improvement of hygiene of the forest through perpetual silviculture practices.
3. Efforts are to be made to bring 1/3rd geographical area of the country under forests and tree cover by plantations on all category of waste lands on farm lands.(Agro-forestry)
4. Expansion of protected area network and maintenance of biodiversity conservation.

5. Non forest waste lands to be planted with mostly fuel wood species as 70% of wood produced from the forest is used as fuel wood. The species of Industrial wood and pulp wood may be increased in farm forestry.
6. Peoples participation in protection and development of degraded forests and fringe forests to be strengthen.
7. Non-wood forests species to be developed and value addition may be promoted at village level.
8. Regulation of grazing in forest as per the carrying capacity and silvicultural needs.
9. Infrastructure for forest inventory, research and development to be strengthened. Human resource development should also be improved.
10. Investment for this sustainable development of forest should be rational and in praporionate to the total production.
11. Supreme court rulings and other rules of the land should scrupulously be fallowed.

SECTION I.4 :- NATIONAL WILD LIFE ACTION PLAN (2002-2016) :-

National Wild life Action Plan was first adopted in 1983 and it had out line the strategies and directions for action for wild life conservation in the country. The action plan 1983 has been in force for a long time. In the changing scenario of the country some problems have become more acute and the new concerns have become apparent which forced a change in priorities. Increase in commercial use of natural resources growth of human population and live stock population and changes in consumption patterns are carrying grater demographic impacts. Therefore biodiversity conservation has attained a focus of interest. The National Forest Policy was also formulated in 1988 in which the priority was given to conservation hence this new national wild life action plan was adopted.

Overview :-

1. Wild Life includes all uncultivated flora and wild fauna of the nature Every species has right to live and every species must be protected to prevent its extension.
2. Water, Wilder-ness and Wild Life are inseparably inter-linked owing to demographic, agriculture and industrial pressures. The wilder-ness areas which are richest repositories of wildlife and bio diversity have either shrunk or disappeared.
3. Effective ecosystem conservation is the fundamental for long term ecological and economic stability. The natural process, forest and wild life habitats recharge aquifers, maintain water regimes and moderate impact of floods and cyclones, there by they ensure food security and regulate climate change. They are also ensure a source of food, fodder, fuel and other products supplement the sustenance of local communities.
4. India represents 6th position among 12 major biodiversity countries of the world. Conservation of biodiversity is directly linked with conservation eco systems and thus with the water and food security.
5. Planning commission has not considered the adverse ecological consequences of shrinkage and degradation of wild life ness from the pressure both human and animal population and commercialization of the forests. The situation has resulted in alarming degradation of nations natural heritage which consist of rivers, aquifers, forests, grass lands, mountains, waste lands, costal and marine habitats. Arid lands and deserts. This has adversely effected natural phenomenon such as breeding, ranging and migration of wild life and geo morphological features.
6. The frequency and intensity of natural disasters the plummeting fertility late of our soils and accelerated degradation of our fresh water resources have further crippled the financial position of the nation. This situation has compelled to realign development priorities to take into account ecological

imperatives including the protection of wild life which sustain and enhance natural habitats for their survival.

7. The rural development schemes for forest dwellers and other wilderness regions have suffered both from inadequate recourses as well as inappropriate measures. It has failed to address their very dependence upon natural biomass resources as well as shrinking and degrading resources base. The productivity in agriculture has also declined due to lack of proper support, causing impoverishment and enhanced pressure on natural resources, Which resulted in grater pressure on the biomass of our forest intern lead to wide spread Alienation of people from the goals of nature conservation efforts.
8. The developmental projects such as hydroelectric dams, mines, etc compounded the problems of wild life conservation.
9. The habitat loss has been compounded by illegal trade which further aggravated by raising demands of wild life products and then lucrative prices in the international market.

POLICY IMPERATIVES :-

Ecological Security :-

In order to maintain and protect the long term ecological security of India, the national development agenda must identify the impact of natural ecosystems from over exploitation. Contamination and degradation. Moreover to maintain long term ecological security short term economic gains must not be permitted to undermine the ecological security.

Priority to Conservation :-

Priority must be assigned both at the central and the state level for conservation. The integration of conservation must be ensured in all developmental programmes evolving proper funding mechanism, enhancement of financial allocation and provision of adequate personeal with requisite experts in order to arrest further degradation and restore wild life and its habitats.

National Land use Policy :-

The Non Wood Forest Produce can not be implemented in isolation restricted to protected area as the wild life is not restricted to National Park and Sanctuaries. Areas out side protected area network are often formed vital ecological corridor and these must be protected to prevent isolation of fragments of bio diversity. The policy of Land and Water use will lead to accept the imperative of strictly protecting ecologically feigned habitats as well as regulating use elsewhere.

Primacy for Water and Sustenance :-

The water resource must be recognized as prime product of our forest and these forest must be managed to protect and optimize the hydrological systems. The National Forest Policy 1988 clearly emphasis conservation of our natural heritage in the form of natural forest, flora and fauna. A critical imperative also to recognize forest, water, land and other natural habitats as a source of survival of millions of people.

In Situ Conservation :-

Emphasis must be accorded to Insitu conservation, the sheer anchor of wild life conservation.

Ex situ measures in zoological parks and gene banks may supplement these objectives without depleting scarce wild resources.

Peoples support for wild life :-

The local communities traditionally depend upon natural bio mass and they have 1st lien on such resources. These benefits are subjected to assumption of basic responsibility to protect and conserve these resources. The conservation programmes must attain to reconcile livelihood security with wild life protection through creative zonation and by adding new protected areas in consultation with the local people such as an inviolative core, conservation buffer, community buffer and multiple use area.

Man - Animal Conflict :-

This is the out come of shrinkage, fragmentation and degradation of habitats which has caused destruction of wild life and generated animosity against wild animals and protected areas which is a crucial management issue that needs to be addressed by innovative approaches.

Strategy for action :-

Adopting and implementing strategies and the needs out lined above will require action for covering the following parameters.

1. Strengthen and enhancing the protected area network.
2. Effective management of protected area.
3. Conservation wild and endangered species and their habitats.
4. Restoration of degraded habitats outside protected areas.
5. Control over poaching, Taxidermy and illegal trade in wild animal and plant species.
6. Research and monitoring.
7. Human Resource Development and personal planning.
8. Encouragement of people participation in wild life conservations.
9. Conservation awareness and education.
10. Wild Life tourism.
11. Domestic legislation and international convention.
12. Enhancing financial allocation for ensuring fund flow to the wild life sector.
13. Integration of national wild life action plan with other sectoral programmes.

SECTION I.5 : FACTOR INFLUENCING THE GENERAL OBJECTS OF MANAGEMENT :-

The major factors influencing the objects of management are given below :-

1. The entire forest was repeatedly managed under coppice with reserved system under of the previous plans, have suffered to a great extent due to illicit felling, heavy and uncontrolled grazing, poorer coppice regeneration resulted in under stocked and open forest and failed to regenerate.

2. These forest may be restored if they are restocked under afforestation schemes along with soil and moisture conservation works with a strict protection from illicit felling, grazing, fire, etc.
3. The general site quality is poor and the crop density is also low in large chunk of forest. The large tracts of forest are open, under stocked and degraded which require vast improvement in quality and stocking.
4. The soil is highly compact due to heavy biotic pressure which is devoid of humus and sub soil moisture.
5. The drainage system of the soil is very poor.
6. The coppice vigour of both teak and misc. has reduced over a period of time, under repeated coppice system resulted in malformed and stunted growth of crop.
7. Teak represents approximately 60% of the total stocking of the forest.
8. The natural regeneration of teak and misc. is scanty due to poor site quality, excessive biotic pressure, repeated fires and adverse climatic conditions moreover whatever natural regeneration comes up have also failed to establish.
9. The forest tracts constituting catchments of various irrigation projects required improvement in crop quality and drainage. The catchment areas treatment need to be intensified and improved upon.
10. Shortage of Bamboo, fodder and other nonwood forest produce requires an augmentation, scientific management, and harvestings.
11. In this division the medicinal plants diversity and abundance required to be protected in selected pockets of their occurrence.
12. Grazing, illicit felling, encroachment and other protection problems are required to be tackled efficiently for better protection and management of the forests and forest areas. The population of wild animals needs to be conserved through habitat improvement measures and effective protection.

SECTION I.6 : GENERAL OBJECTS OF MANAGEMENT :-

1. To preserve and enrich the growing stock in natural forests and to restore all under stocked and degraded areas of the forest with better stocking by taking up soil and moisture conservation measures, and reforestation.
2. To effectively protect the forest and forest areas with the help of local people and better infrastructure facilities.
3. To replace poor and less vigorous stock gradually with better vigorous stock by continuous induction of better germ plasm.
4. Treatment of catchment and drainage of forest areas of various irrigation projects.
5. Preservation and improvement forest to obtain progressively increasing yield of small timber, fire wood, poles and fodder. In order to meet the demands of the local people and to provide grazing areas to local cattle.
6. To check the ill effects of soil erosion where ever it has already started and to prescribe preventive measures.
7. To augment the availability and production of non wood forest produce specially medicinal plants by protecting in the forest areas and undertaking their plantations.
8. Improvement of production of fodder by undertaking silvi-pasture development works.
9. To achieve appropriate wild life management with emphasis of rare and endangered and endemic species like Tigers, Panthers, Sloth bear, Wild dogs, etc.
10. To increase productivity of the forest and to ensure progressively increasing yield of the forest produce in demand.
11. To provide ecological services to the area by protecting and improving the forest.

SECTION I.7 : ANALYSIS AND VALUATION OF THE CROP :-

The enumeration of the growing stock has been carried out by the SOFR unit Amravati. The results of enumeration have been given in Appendix no XXXV in the draft plan report volume II. The analysis of the data of growth and growing stock reveals that there is a marginal increase in growing stock when compared to 1996 enumeration. However there is decrease in the stock when compared to 1972 enumeration data. The possible reasons for marginal increase in the growing stock when compared to 1996 may be protection and management interventions. The substantial decrease in the growing stock when compared to 1972 enumeration data due to population increase of both human and cattle, illicit felling, encroachment, heavy biotic pressure, repeated fires, etc.

The data analysis of 1972 highlights the percentage of teak was more in growing stock and the same trend revealed in 1996 enumeration data but the situation is changed as per 2004 enumeration data. The data analysis of 2004 enumeration carried out by SOFR unit Amravati highlights that the percentage of Misc. crop is more than that of teak. The possible reasons are non removal of misc. species except dead, dying, disease etc where as the prescriptions for removal teak trees above harvestable girth were prescribed in management plans. Besides the illicit felling by local people is more in case of teak when compared to misc. species.

The analysis of enumeration 2004 data further reveals that the percentage of teak reduced in lower girth classes i.e. 15/30, 31/45, in comparison to nonteach species. In higher girth classes i.e. 45/60, 61/75 and 76/90 the teak percentage is more than that of non-teak species and 90/105 and above girth classes the percentage miscellaneous species is more than that of teak.

In general the analysis of enumeration data reveals that the percentage of nonteach is more than that of teak

TABLE NO.- 35 A

**THE STATUS OF STOCKING IN DIFFERENT WORKING CIRCLES IN
GUPTA'S PLAN**

Sr. No	Name of working circle		Total Area (In ha.)	Density			Blanks Area
				0.6 & above	0.4 to 0.6	0.1 to 0.4	
1	Conversion to High Forest Working Circle.	Area *	8,454.02	3953.40	2365.10	995.47	1140.05
		Percentage		46.76%	27.98%	11.77%	13.49%
2	Improvement Working Circle	Area *	14,257.69	4632.48	5491.11	1875.65	2258.45
		Percentage		32.49%	38.51%	13.16%	15.84%
3	Afforestation Working Circle	Area	13957.87	1755.35	4207.94	2288.29	5706.29
		Percentage		12.58%	30.15%	16.34%	40.88%
4	Catchment area Treatment W.C.	Area	29024.62	4943.44	11330.21	5656.91	7094.06
		Percentage		17.08%	39.04%	19.49%	24.44%
5	Fodder Working Circle	Area	2030.47	299.45	448.59	298.24	984.19
		Percentage		14.75%	22.09%	14.69%	18.47%
	Total		67,724.67	15,584.12	23,843.95	11,114.56	17,183.04
	Total of Percentage			23.01%	35.21%	16.41%	25.37%

* Excluding the extended area of Painganga wildlife sanctuary (10,027 ha) from conversion (6,543.80 ha) and improvement working circle (3,483.27 ha) and area of FDCM (255.84 ha) from improvement WC.

TABLE NO. – 35 B

**THE STATUS OF STOCKING IN DIFFERENT WORKING CIRCLES IN
PRESENT PLAN**

Sr. No	Name of working circle		Total Area (In ha.)	Density			Blanks Area
				0.6 & above	0.4 to 0.6	0.1 to 0.4	
1	Selection Cum Improvement Working Circle.	Area *	36774.54	9270.71	14859.17	6237.36	6407.30
		Percentage		25.21%	40.41%	16.96%	17.42%
2	Catchment Area Treatment Working Circle	Area *	17015.00	0	7437.13	8126.01	1451.86
		Percentage		0%	43.71%	47.76%	8.53%
3	Afforestation Working Circle	Area	12297.03	2725.02	5058.99	2107.71	2405.31
		Percentage		22.16%	41.14%	17.14%	19.56%

5	Fodder Improvement Working Circle	Area	1680.90	372.28	691.16	287.95	329.51
		Percentage		22.15%	41.12%	17.13%	19.60%
6	Miscellaneous Working Circle	Area	1667.79	0	0	833.89	833.90
		Percentage		0%	0%	49.99%	50.01%
	Total		69435.26	15313.09	27807.91	12429.01	13885.25
	Total of Percentage			22.05%	40.05%	17.90%	20.00%

SECTION I.8 :- FUNCTIONAL CLASSIFICATION OF FOREST :-

The Government of Maharashtra vide G.R.No. MEP-1365/132211-Y, Dt. December 6, 1968 classified the state forest into following category.

1. Protection Forests.
2. Tree Forests.
3. Minor Forests.
4. Pasture Lands.
5. Miscellaneous Forests.

1. Protection Forests :-

This category consist of forest on very strip slopes, 25° and above and the forest situated along river banks, the forest that have depleted on account of maltreatment and heavy biotic pressure and further harvesting will accelerate soil erosion and affect the agriculture productivity in the lower plains adversely.

The management will aim at improvement of the forest both in quality and quantity and soil and moisture conservation measures.

2. Tree Forests :-

This includes the forest situated in remote areas where the biotic pressure is negligible and this forest shall be capable of producing large size and commercially valuable timber and other products of economic values.

3. Minor Forests :-

These forests are situated adjoining to cultivated lands and are subjected to heavy biotic pressure. These forests are capable of producing minor timber, fuel wood, fodder and other forest produce to fulfill the needs of local population.

4. Pasture Lands :-

The nature of this forest is generally, highly degraded, open sparsely stocked or mostly scrub lands. These lands are unable to produce small timber but provide grazing land to local cattle population.

5. Miscellaneous Forests :-

This category includes 1. Grass reserves, 2. Remaining areas.

The grass reserves are small patches of forest situated adjoining to cultivated lands or habitats. This forest have scrub vegetation capable of producing good quality of fodder. The remaining areas in this category are needed for other works, with regard to wild life habitat most of the forest track in this division is potential habitat for many kind of wild life. Some of the areas rich in wild flora specially medicinal plants.

SECTION I.9 : METHOD OF TREATMENT :-

The method of treatment to be adopted is influenced by the situation and condition of forest, status of regeneration of the crop, needs of local people, availability of labour force, staff and resources. Encouragement of natural regeneration where ever present, shall be properly tended for planting operations Local tree species shall preferred and participation of local villagers in forestry operations like afforestation, protection shall be encourage. Extensive soil and moisture conservation measures shall be taken up. These forests will be effectively protected from illicit felling, encroachment, unregulated grazing and repeated forest fires.

1. **Protection Forests :-** This type of forest occur in small and scattered patches throughout the division. These are treated under type of area 'A' category of the respective working circle. The patches of protection forest in Pusad, Shembalpimpri, Mahagaon, Umerkhed and Digras Ranges falling in catchment of irrigation projects proposed are to be treated under catchment working circle. In these areas the method of treatment is extensive soil and moisture conservation works along with gap plantation wherever needed. No felling is prescribed in these areas.
2. **Tree Forests :-** These forests are situated mostly along Painganga river in a narrow strips fall in Kharbi and Bittergaon Ranges. Most of these areas transferred to Painganga wild life sanctuary. The small areas left on the periphery of Painganga wild life sanctuary including old teak plantation shall be treated under teak plantation working circle. Some of the areas, some of the patches shall also be treated under Selection cum Improvement Working Circle. Tending of natural regeneration wherever it is adequate and taking up soil and moisture conservation measures and plantation of timber species will be taken up, where ever natural regeneration is inadequate.
3. **Minor Forests :-** Major area of Pusad Forest division fall in this category of the forests. These forests represent mostly site quality 'IVB' and to a limited extent site quality 'IVA' dominated by teak. This type of forest generally situated in Umerkhed, Mahagaon, Shembalpimpri and Digras ranges.

The well stocked forest of this category or proposed to be treated under Selection cum Improvement. These forests are capable of producing small timber and fuel wood. In this area extensive soil and moisture conservation works along with gap plantation is prescribed. Highly degraded areas in this category because of excessive biotic pressure is proposed to be managed under afforestation working circle.

4. **Pasture Forests :-** These areas are proposed to be treated under silviculture pasture working circle.

5. **Miscellaneous Forests :-** The area is transferred to other department in the past and yet to be deforested proposed to be kept under Miscellaneous working circle.

The overlapping working circles are proposed for treatment in the division are

1. Non Wood Forest Produce.
2. Joint Forest Management.
3. Wild Life Conservation.
4. Forest Protection Working Circle.

SECTION I.10 :FORMATION OF WORKING CIRCLES:

The following working circles have been proposed based on the objects of management and methods of treatment-

- I.** Selection Cum Improvement Working Circle.
- II.** Afforestation Working Circle.
- III.** Catchment area treatment Working Circle
- IV.** Silvi -Pasture Working Circle.
- V.** Non Wood Forest Produce (Overlapping) Working Circle.
- VI.** Joint Forest Protection (Overlapping) Working Circle.
- VII.** Wild life Conservation (Overlapping) Working Circle.
- VIII.** Forest Protection (Overlapping) Working Circle.
- IX.** Miscellaneous Working Circle.

The area assigned to each proposed working circle is given under-

TABLE NO. – 36

WORKING CIRCLES AND AREA ASSINGED

Sr.No.	Working Circle	Area (In ha.)	Percentage
1	Selection Cum Improvement WC	36774.54	52.96%
2	Afforestation WC	12297.03	17.71%
3	Catchment area treatment WC	17015.00	24.50%
4	Silvi Pasture WC	1680.90	2.42%
5	Miscellaneous WC	1,667.79	2.41%
	Total	69,435.26	100%
7 to 10	Overlapping WC	Includes the above total forests area	

1. Selection Cum Improvement Working Circle :-

Majority of these areas were managed under Coppice with Reserve Working Circle (CWR), SCI working circle, Miscellaneous Working Circle, Plantation Working Circle, Fodder Reserve Working Circle and Pasture Working Circle in the previous management plan. Whereas in the on going Gupta's plan these areas are under the management of Conversion to High Forest, Catchment Treatment and Improvement Working Circles. These forests are characterised by both good quality as well as degraded forests mixed together. These forests are capable of yielding good quality of timber, small timber and fuel wood. The basic aim of management is to improve the condition of the crop by tending natural regeneration and supplemented it by artificial regeneration where ever necessary. In the good quality patches, matured trees will be harvested (above exploitable girth) if the trees are available silvicultural. Suitable soil and moisture conservation works shall be advocated to improve the site quality, subsequently the crop condition. The forest area included in this working circle is 36774.54 ha.

2. Catchment Working Circle :-

The forest areas falling in the catchment areas of irrigation, drinking water projects and directly draining into water bodies or reservoirs are included in this working circle. These areas were previously managed under Coppices with Reserve, Misc., Plantation, Fodder and Pasture Improvement Working Circles. The idea of creating this working circle is to prolong the life of irrigation as well as drinking water projects by controlling soil erosion and siltation in the reservoirs. Treatment of catchments includes soil and moisture conservation measures, drainage treatment and improving vegetation cover to prevent soil erosion and to check run off in the catchment areas. The area proposed to be included in this working circle is 17015.00 ha.

3. Afforestation Working Circle :-

This working circle consist of major portion of 'C' class reserve forests which were previously managed under various working circle's, CWR, Misc, Pasture and Plantation working circles. In the on going Gupta's plan these areas are under the treatment afforestation working circle 12297.03 ha. area is proposed to be included in the working circle. The governing aim is to improve the vegetation cover both in quality and quantity and to meet local demands of small timber, fuel wood, fodder and other forest produces by undertaking plantations in degraded under stocked and blank areas.

5. Fodder Improvement Working Circle :-

This working circle includes open and sparsely stocked not capable of yielding timber any more and these areas were managed under Misc., Plantation, Pasture Improvement, in the previous plans. In the on going Gupta's plan these areas allotted to fodder reserved working circle. The extent of area allotted to this working circle is 1680.90 ha. The basic aim to constitute this working circle is to raise good fodder species to meet the fodder demand for cattle population of local people.

6. Non-Wood Forest Produce (Over Lapping) Working Circle :-

This working circle covers the entire area of the division as it is termed as over lapping working circle. Non wood forest produce like Tendu leaves, Dhawda and Karai gum, Moha flowers and seeds, myrabolons (Behada, Hirda, Aoala) and Rosha grass available on limited scale in selected patches. There is a fair demand for Non wood forest produce in the market. The aim is to improve the yield of existing non wood forest produce species and introduce the concept of sustainable yield and encourage the growth and development of non wood forest produce species by means of protection and scientific management and by way of plantation.

7. Joint Forest Management (Over Lapping) Working Circle :-

This working circle overlaps entire divisional area of Pusad division. Forest protection and management aimed involving local people with mutual understanding. The benefits obtained out of effective protection and management by the local people can be shared between Government and members of Joint Forest Management committees as per the prevailing Government orders.

8. Wild Life Conservation (Over Lapping) Working Circle :-

This is constituted mainly to protect the existing wild life specially rare and endangered species and to take up measures to improve habitat conditions in terms of shelter, food, forage, water and refuge.

9. Forest Protection (Over Lapping) Working Circle :-

The protection of the forest ensured at most important and difficult task of the present day forest management. Rapid dwindling of forests and forest lands coupled with increase human and cattle population created a huge gap between demand and supply of forest produce. The inclination and greed of the people towards tangible benefits and individual short time gains dominated over realizing intangible benefits and social long term gains alarmed forest protection lead to rapid degradation of forest and forest areas. By considering gigantic problem of forest protection the Government of India made it mandatory have forest protection over lapping working circle in all working plans. Forest Protection is a major and complex problem which needs nultifronged approach for solution. The strategy suggested to tackle gigantic problem of forest protection is an integrated approach and it shall be applied various fronts by undertaking corrective measures. It is directly related to field actions in participatory manner to manage the forest through active participation of local people i.e. through Joint Forest Management approach. Some of the measures suggested and proposed are.

1. Enhancement of productivity of forest by taking up extensive soil and moisture conservation works, natural and artificial regeneration and other cultural operations.
2. Strict control of fires and regulation of grazing.
3. Active participation of local people in all operation of forest management.
4. Meeting the demands of local peoples for forest produce.
5. Creation of employment even during lien period.
6. Strengthen of available infrastructure.
7. To tackle forest offences, by introducing rewards and informers system.

10. Miscellaneous Working Circle :-

The areas already transferred to other departments for non forestry purposes and the areas yet to be deforested are allotted to this working circle. It is prescribed to initiate disforestation in these areas as early as possible and these areas are required to i.e. deleted from form no.1. Total area included in this working circle is 1667.79 Ha.

SECTION I.10 :- BLOCKS AND COMPARTMENTS :-

The total area of Pusad Forest Division excluding the area of Painganga Wild Life Sanctuary 69435.26 Ha. Out of total area the 'A' class reserve forest constitute to the extent of 53075.10 Ha. the reserved forest blocks and compartments of Gupta's plan have been continued for the convenient of management and for easy identification by the field staff. The average area of each compartment is approximately 322 Ha. and total number of compartments are 166.

The 'C' class reserve forest is situated in scattered patches in about 99 villages and the extent of area is 15830.25 The compartment number given Gupta's plan are retained as such for the convenience of staff and for easy identification of compartments.

The Protected Forest situated in six villages which is divided into 7 compartments. The total area of Protected Forest is 451.45 Ha.

The Unclassed forest is to the extent of 78.46 Ha. which was taken over for compensatory afforestation. This forest constituted in one compartment.

Total compartments of the division is 270 out of which 'A' class 166, 'C' class Reserve Forest 95, Protected forests compartments 7 and Unclassed forest 2.

SECTION I.11 :- PERIOD OF PLAN :-

The period of plan is declaimed for 10 years from 2008-09 to 2017-18. The mid term review can be under taken after 5 years i.e. 2013 if the situation demands and proposal moves by concern Chief Conservator of Forests.

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CHAPTER II

WORKING PLAN FOR THE SELECTION CUM IMPROVEMENT WORKING CIRCLE

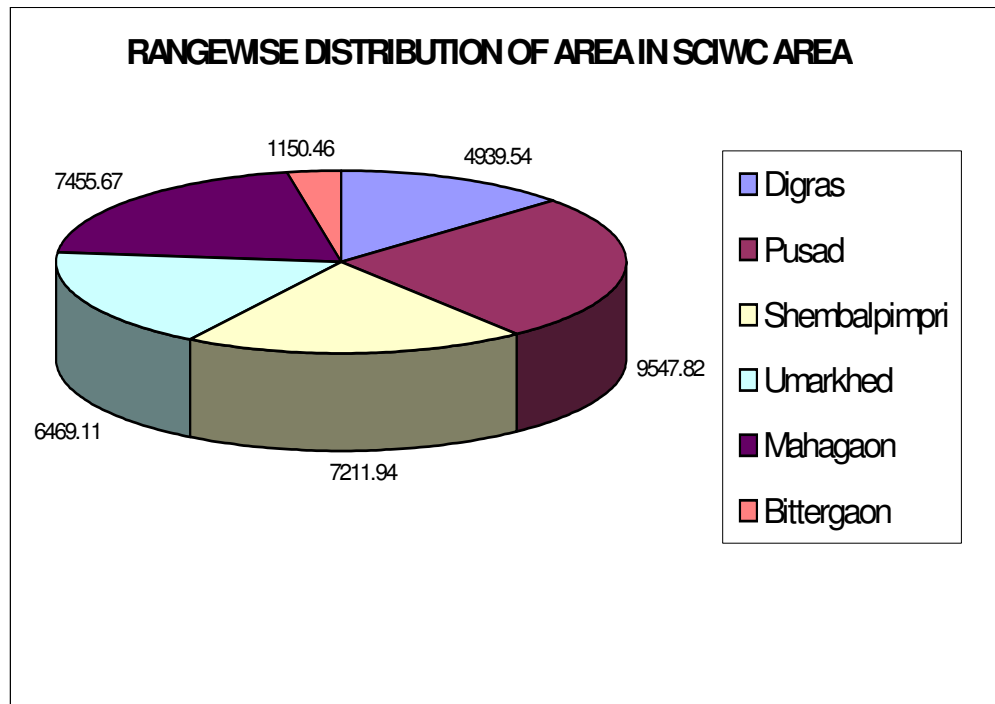
SECTION II.1 : GENERAL CONSTITUTION:

II.1.1 This working circle includes better quality teak forest of the region. The areas capable of producing large size timber and poles are included in this working circle. These areas may be either fully stocked or partly stocked or even degraded areas. These areas were during last 50 years managed under various working circles such as coppice with reserve, SCI, Miscellaneous, Plantation & Pasture improvement working circles. In Gupta's plan majority of these areas were treated under Conversion to High Forest, Improvement and Catchment Treatment working circles. The forest area included in this working circle is 36774.54 ha.

Range wise distribution of area of Selection cum improvement working circle under different categories is given in table below.

TABLE NO. 37
**RANGEWISE AND CATEGORYWISE DISTRIBUTION OF AREA IN
SELECTION CUM IMPROVEMENT WORKING CIRCLE**

Sr N o.	Range	Area of the Range (ha)	Area allotted (ha.)				% to the area of the Range	% to the area of WS
			RF.	PF	UF	Total area		
1	Digras	16392.93	4939.54	---	-	4939.54	30.13	13.43
2	Pusad	16828.97	9547.82	---	-	9547.82	56.73	25.96
3	Shembal pimpri	12728.70	7211.94	---	-	7211.94	56.66	19.61
4	Umarkhed	11222.45	6469.11	---	-	6469.11	57.64	17.59
5	Mahagaon	10293.78	7455.67	---	-	7455.67	72.43	20.27
6	Bittergaon	1968.43	1150.46	---	-	1150.46	58.45	3.13
	Total	69435.26	36774.54	---	-	36774.54	52.96	100.00



II.1.2 The reasons for assigning the area to SCI working circle earlier treated under Conversion to High Forest, Improvement, and Catchments Treatment working circle in on going Gupta's plan are as under :-

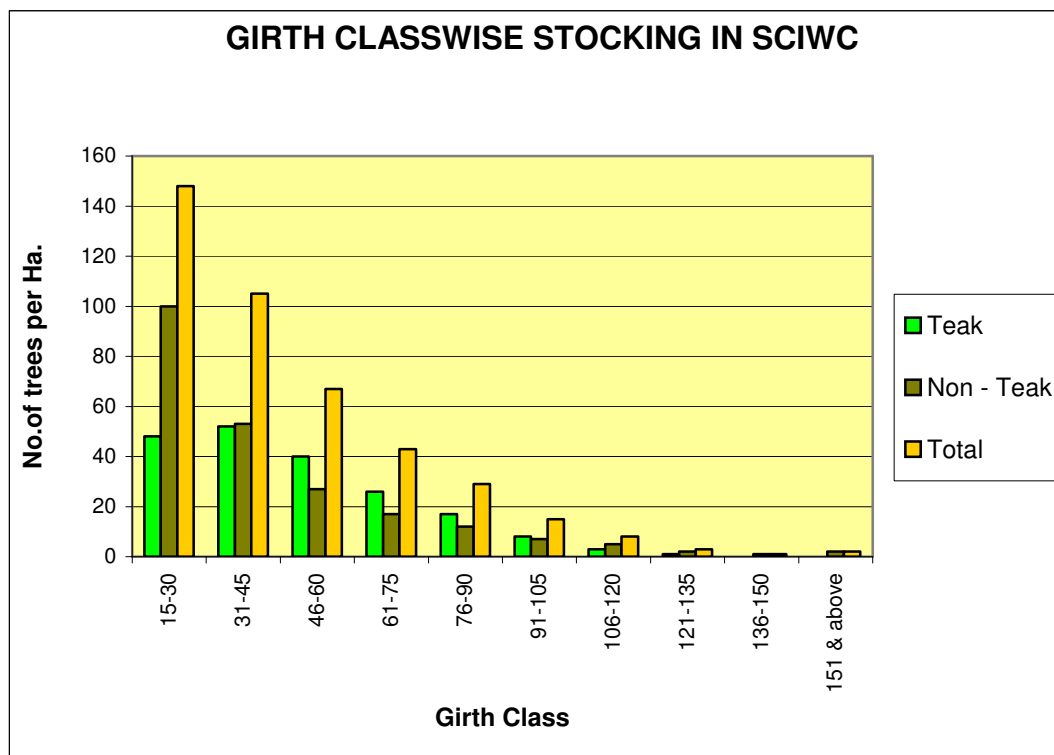
- i. The crop is uneven aged and there is no uniformity in crop quality, density and regeneration. There is mixture of all age classes and girth classes through out the forest and the soil conditions also vary throughout.
- ii. In Gupta's plan, the area was treated under Conversion to High Forest with a view to allow the healthy coppice to mature and subsequently allow selective removal based on exploitable girth, and also encourage regeneration of seed origin crop. The area was not allotted to any periodic blocks and the system seemed to be more or less similar to SCI.

- iii. The area treated under Improvement working circle was prescribed with improvement felling only since the crop was poor. After the stocking has improved the area needs to be brought under SCI to take advantage of selection fellings.
- iv. The enumeration data indicates that there are more than 15% trees in girth classes of above 100cm. and these trees can be exploited on sustained basis in SCI system along with improvement fellings.
- v. The Conversion of these forests to High Forest of seed origin would require lot of time as these forests are basically coppice origin, Most of these areas were treated under coppice with standard and coppice with reserve systems in the past. Since last 90 years, it is prudent to bring them now under SCI with preferential Treatment to remain coppice crop with seed origin crop.
- vi. Some of the areas that were included in Catchment Treatment Working Circle in Gupta's plan were previously managed under SCI of Pal's plan which are capable of producing timber, More over in Gupta's plan, marking of the trees in 'D' category area of Catchment Treatment Working Circle was similar to that of SCI.

SECTION II.2 : GENERAL CHARACTERS OF VEGETATION :

II.2.1 The forests included in the working circle represent mostly teak along with natural associates of miscellaneous species. As per SOFR Amaravati data of 2004. Number of teak trees per ha. 195 and miscellaneous 226, total comes around to 421. The site quality conforms to IVb and IVa. With some patches of site quality III. The principal species of the crop is teak with its natural associates like Dhawda, Moha, Ain, Lendia, Salai, Bhirra, Kalam, Char, etc. The distribution of Salai is common in dry locations. The crop is young

to middle aged and open at some places with little proportion of harvestable crop. The teak is mostly of coppice origin and the growth is stunted and malformed which constitute about 60% of the total stock. The established regeneration is meagre in number though young recruits are seen in some places. The forest can largely be grouped into “poor quality teak forests”. The forests having the density of the crop in between 0.4 and 0.7.



SECTION II.3 : SPECIAL OBJECTS OF MANAGEMENT :

II.3.1 The special objects of management are:

1. To gradually replace the stunted, low vigour teak coppice crop with high forest of seed origin by encouraging establishment of natural regeneration.
2. To improve the general stocking of the forest in density, composition quality and regeneration.
3. Encouraging NR assisted by AR by introducing selected germplasm.

4. To optimize timber, poles and fire wood production in order to meet the local demand.
5. To have balanced proportion of miscellaneous species and species of Non wood forest produce in the growing stock.
6. To maintain and improve adequate soil cover by taking up intensive soil and moisture conservation measures and to improve the condition of site.
7. To check soil erosion specially in the catchment areas and to increase the life of water reservoirs.

SECTION II.4 : ALLOTMENT OF COMPARTMENT TO VARIOUS FELLING SERIES IN SCI WORKING CIRCLE :-

II.4.1 114 compartments have been allotted to this working circle and these compartments are divided into 23 felling series having 20 coupes in each one of them. The average coupe area is around 84 ha.

TABLE NO. – 38

ALLOTMENT OF COMPARTMENT TO VARIOUS FELLING SERIES IN SELECTION CUM IMPROVEMENT WORKING CIRCLE

Sr No	Range	felling Series		Compartment allotted	Area (ha)	Total area of the W.S.	Total area allotted from each Range (ha)
1	Digras	1	Arambi	739, 740, 741, 742.	1400.66	1400.66	4939.54
		2	Dolamba	325, 326, 327, 328, 329, 337.	2209.66	2017.78	
		3	Singad (Pt.)	344, 345, 352, 355, 357.	1403.10	1403.10	
		4	Marwadi (pt.)	774pt., 789pt, 798pt, 803pt.	1050.68	118.00	

Sr No	Range	felling Series		Compartment allotted	Area (ha)	Total area of the W.S.	Total area allotted from each Range (ha)
2	Pusad	5	Wadad	346, 347, 350, 351.	1457.33	1457.33	9547.82
		6	Jamani	354, 358, 362.	981.80	981.80	
		7	Panhala	348, 383, 384, 388, 824.	1617.42	1617.42	
		8	Khandala	390, 395, 397, 398.	1065.98	1065.98	
			Singad (Pt.)	389.	283.29	283.29	
		9	Gahuli	360, 361, 363pt, 364, 406.	1521.55	1503.64	
		10	Yeldari	399, 400, 401, 402, 405	1697.31	1697.31	
		11	Pandurna	353pt, 382pt, 385pt., 393.	1310.41	449.55	
			Marwadi pt.	394, 396pt.	638.63	436.90	
		12	Botha pt.	391pt, 392pt	768.53	54.60	
3	Shembal-pipri	13	Shilona	418, 419, 421, 422, 423.	2165.55	2165.55	7211.94
		14	Amdari	414, 416, 417, 420, 763.	2075.42	2075.42	
		15	Khed	764, 765, 766, 833, 835, 838, 840, 841, 844.	1976.87	1976.87	
		16	Pipalgaon (P)	413, 845, 859.	924.90	924.90	
			Botha (pt.)	851pt, 857pt.	290.80	69.20	
4	Umarkhed	17	Taroda Beldari	428pt, 429, 430, 431, 434, 435.	2040.90	2039.77	6469.11
		18	Ghanmukh(P)	436, 437, 438, 439, 440, 448.	1861.22	1861.22	
		19	Baldi	456, 457, 458, 459, 460, 461.	1764.08	1764.08	
		20	Dagadthar (Pt.)	863.	203.54	203.54	
			Marwadi (pt.)	427pt., 464.	691.63	352.80	
			Pandurna	455	247.70	247.70	
5	Mahagaon	19	Pimpri	445pt, 446, 447, 451, 752..	1537.03	1524.14	7455.67
		21	Shirmal	478, 479, 480, 745, 821.	1567.26	1567.26	
			Ghanmukh(P)	441, 442.	562.13	562.13	
			Dagadthar(P)	452, 453, 454, 753, 754.	1458.13	1458.13	
			Marwadi pt.	481.	257.39	237.39	
			Pandurna pt.	482.	475.93	475.93	
		22	Karanjkhed-Kaudgaon	334, 760, 761, 762.	1235.94	1137.94	
6	Bitergaon		Pimpalgaon(P)	496, 499, 519	1142.46	1142.46	1150.46
			Pandurna pt.	495pt.	--	8.00	
			Botha pt	496, 499	738.17	738.17	
	Total	22 Felling series		128 compts.	40641.61	36774.54	36774.54

SECTION II.5 : ANALYSIS AND VALUATION OF THE CROP :

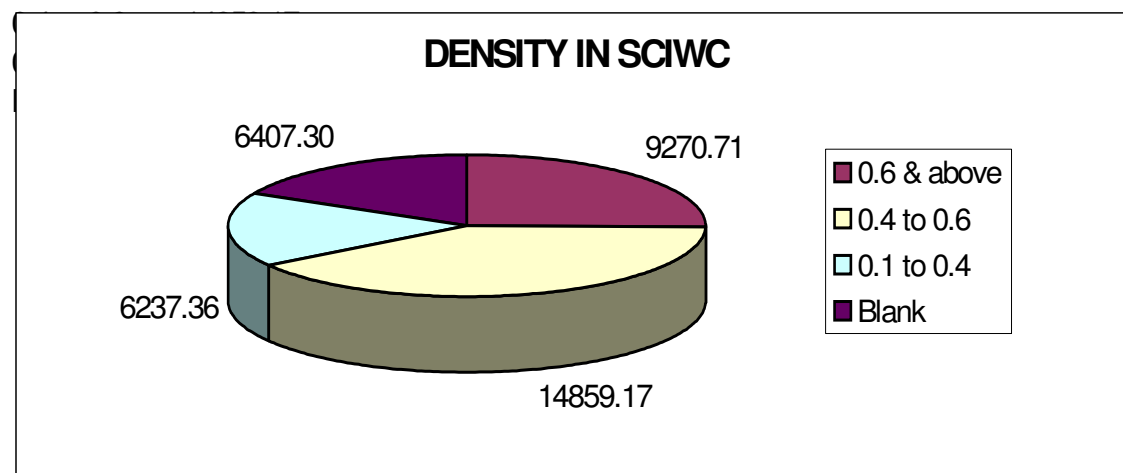
II.5.1 The existing stock maps are updated. The stocking is also assessed with the help of satellite imageries and with adequate ground truth verification.

II.5.2 The forest of this working circle is mixed type i.e. well stocked at some places, moderately stocked at other places and under stocked or even open type in some places through out the area. The details of stock assessed from satellite imagery indicates that out of 36774.54 ha. area of SCI, 25.21% area having the density above 0.6, 40.41% area having density between 0.4 to 0.6 and 16.93% represent density 0.1 to 0.4 and remaining the 17.42 % of area falls in the category of blank area.

TABLE NO. - 39

THE ENUMERATION DATA RESULTS OF SCI WORKING CIRCLE

Sr. No.	Name of Working Circle	Area percentage	Total area in ha.	Density / % to the w.c. area			Blank
				0.6 & above	0.4 to 0.6	0.1 to 0.4	
1	Selection Cum Improvement (SCI)	52.96%	36774.54	9270.71 (25.21)	14859.17 (40.41)	6237.36 (16.96)	6407.30 (17.42)



The inventory data of growing stock has been computed by laying sample plots compartment wise. The site quality of sample plots differ from plot to plot, even in the same compartment, which indicates that a particular compartment may contain growing stocks of different site qualities.

TABLE NO. - 40

**ENUMERATION DATA (GIRTH CLASSWISE) IN SELECTION CUM
IMPROVEMENT WORKING CIRCLE**

Sr.No	Girth Class	Teak			Others			Total	
		No.	%age wrt Total teak spp.	%age wrt Total stock.	No.	%age wrt Total Misc. spp.	%age wrt Total stock.	No.	%age wrt Total stock
1	15-30	48	24.62	11.40	100	44.25	23.75	148	35.15
2	31-45	52	26.67	12.35	53	23.45	12.59	105	24.94
3	46-60	40	20.51	9.50	27	11.95	6.41	67	15.91
4	61-75	26	13.33	6.18	17	7.52	4.04	43	10.21
5	76-90	17	8.71	4.04	12	5.31	2.85	29	6.89
6	91-105	8	4.10	1.90	7	3.10	1.66	15	3.56
7	106-120	3	1.53	0.71	5	2.21	1.19	8	1.90
8	121-135	1	0.51	0.24	2	0.88	0.48	3	0.71
9	136-150	0	0	0.00	1	0.44	0.24	1	0.24
10	151&above	0	0	0.00	2	0.88	0.48	2	0.48
	Total	195	100	46.32	226	100.00	53.68	421	100.00

SECTION II.6 : METHOD OF TREATMENT / SILVICULTURAL SYSTEM :

II.6.1 The most of areas included in this working circle have been managed repeatedly under “Coppice with Reserve System” in the past. The crop in general deteriorated in quality, density and composition over a period of time due to loss of coppice vigour and non establishment of regeneration of seed origin. The percentage of teak improved over the years which constitutes approximately 60% of the growing stock. However miscellaneous species have not shown substantial increase in composition of the crop due to poor coppicing vigour. By keeping above factors in mind the need for change in silvicultural system is necessitated. In the previous plan the silvicultural system was “Conversion to High Forest” aiming at treating the crop through the system based on coppice regeneration to the system based on seedling regeneration by protecting and tending the seedling natural regeneration supplemented by artificial regeneration wherever necessary.

II.6.1 But it was observed that the seedling raised young recruits generally did not establish due to compact soil structure and biotic interference and therefore the idea of sacrificing coppice regeneration while retaining only seedling of seed origin is not favoured. So the silvicultural system favoured and adopted is SCI, aiming at protecting and tending the seedling regeneration while creating desirable gaps to increase Natural Regeneration by harvesting mature trees as per silvicultural principles.

SECTION II.7: Method of Treatment :-

II.7.1 Natural Regeneration will be increased and improvement of site quality conditions shall be attended by taking up soil and moisture conservation works as per the suitability of the site. Coppice regeneration will be thinned depending upon the site and crop requirements, retaining one most promising and vigorous shoot per stool.

II.7.2 The trees that are available silviculturally and fulfill the condition of exploitable girth and available coppice trees will be marked for felling.

II.7.3 Improvement fellings like removal of dead, diseased, dying and malformed will be undertaken.

II.7.4 The miscellaneous species of Non Wood Forest Produce and fruit species shall be retained.

II.7.5 Natural regeneration shall be supplemented with artificial regeneration, 50% teak and 50% miscellaneous keeping total natural regeneration and artificial regeneration seedlings 1000 per ha. natural regeneration shall include the young recruits of below 15cm in girth and pole crop of 15 to 30cm girth. It is prescribed that the established regeneration will be considered while supplementing natural regeneration with artificial regeneration.

SECTION II.8 : FELLING CYCLE :

II.8.1 The felling cycle is fixed at 20 years.

SECTION II.9 : REGENERATION :-

II.9.1. The regeneration activity shall be taken up as prescribed in misc. regulations.

SECTION II.10 : CHOICE OF SPECIES :

II.10.1 Choice of species : The choice of species mostly depends upon the site required and preference of local people. It is suggested that 50% teak and 50% miscellaneous species shall be planted and priority shall be given to species of Non Timber Forest Produce in comparison to existing miscellaneous species. Care shall be taken to introduce species of medicinal value, fodder, and edible fruits to the extent of 20% in the total planting stock only.

SECTION II.11 : HARVESTABLE GIRTH :

II.11.1 In Gupta's plan the harvestable girth for teak was fixed at 75cm. at breast height for site quality IV on the basis of stem and stump analysis from the adjoining Pandharkawda Division. The stem analysis for Pusad Forest Division has been carried out. The site quality of Pusad forest division is mostly IV. To carry out stem analysis representative sample of trees from four compartments of Pusad and Digras ranges have been collected. The observations made during the stem analysis that the teak trees tend to develop hollowness as they attain the girth at breast height 75 cm. and more. The percentage of hollowness increase with the increase of girth of teak trees. It is also observed that at 105 cm. GBH and above almost all the teak trees are hollow. That was verified by actual felling and the hollowness found during the stem analysis. The CAI-MAI curve for teak trees intersect each other at 77 cms. at gbh. Therefore the harvestable girth is kept at 75 cm. gbh in the teak trees for site quality IV.

SECTION II.12 : FORMATION OF FELLING SERIES AND COUPES :

II.12.1 The total area of the working circle shall be divided into 23 felling series and 20 coupe in each felling series. The details of which are given in APENDIX NO. XLI (B) of volume II.

SECTION II.13 : REGULATION OF YIELD :

II.13.1 Annual yield shall be regulated by area, and the efforts are made, for making annual coupes as equi-productive as possible.

II.13.1.1. In previous working plan, the yield calculation for Selection Cum Improvement Working Circle was made on the basis of Sagreiya's modification of Brandis' formula. Since the continuity in the working is to be maintained, same formula has been utilised for yield calculation in the present plan.

II.13.1.2. Mathematical analysis for K.P. Sagreiya's modification of Brandis' Method of determining the maximum sustained cut of trees of exploitable size from all-aged forest is given as below;

If-

- (i) The number of trees in Class I (Exploitable Girth Class) is S_1 ;
- (ii) The number of trees in classes II, III ... are $s_2, s_3, \dots$;
- (iii) The fraction of the trees of classes II, III, ... that survive and are eventually available for harvesting as class trees are $x_2, x_3, \dots$, so that $x_2 s_2 = S_2$; $x_3 s_3 = S_3$; ...
- (iv) The trees take $Y_2, Y_3, \dots$ years in classes II, III, ..., so that the average annual recruitments in the class periods are-

$$S_2 / Y_2 = R_2$$

$$S_3 / Y_3 = R_3, \dots$$
- (v) The overall average annual recruitment for the entire enumeration period, i.e.,

$$(S_2 + S_3 + \dots) / (Y_2 + Y_3 + \dots) = S / Y$$
 is say R .
- (vi) The felling cycle adopted is f years and
- (vii) The accruing average annual recruitment during the 1st, 2nd, Cycles is $R', R'', \dots$, so that the recruitments, accruing in successive cycles, i.e. $f R', f R'', \dots$ are given by as follows:

$$f R' = a R_x + (f - a) R_{x+1}$$

$$f R'' = b R_y + (f - b) R_{y+1}, \dots$$

Then the realizable recruitments $R_{r1}, R_{r2}, \dots$ in cycles I, II, Will be

$$R_{r1} = \frac{1}{2} [f R' - a (R' - R_x)],$$

$$R_{r1} = \frac{1}{2} [f R'' - a (f R'' - R_y)], \dots$$

Therefore, the prescribed yield should be –

$$I/f [S_1 + f R'/2 - a (R' - R_x)/2],$$

$$I/2f [S_2 + f (R' + R'')/2 - b (R'' - R_y)/2], \dots$$

According as the stock in hand has to be liquidated in 1, 2, ... cycles, to obtain the maximum sustained yield, while the actual recruitment is still less than R .

From this it follows that if the overall annual recruitment R is to be realized on a sustained basis even while the realizable recruitment in a cycle is less than fR , there must be a stock in hand of –

$$S_I = f [R - R'/2] + a (R' - R_x)/2,$$

$$S_{II} = f [2R - (R' + R'')/2] + b (R'' - R_y)/2, \dots$$

According as the deficiency continues for I, 2, 3, ... felling cycles.

For the tract dealt with, in Selection Cum Improvement working Circle consisting of all aged forests:

We have girth wise distribution of trees, years to cross the class according to stem analysis of teak tree of Site Quality – IV and selection girth fixed is 75 cm.

TABLE NO. - 41

	Teak	Non Teak	
Girth class	stems/ha	stems/ha	Years in class
16-30	48	100	9
31-45	52	53	8
46-60	40	27	12
61-75	26	17	12
76-90	17	12	
91-105	8	7	
106-120	3	5	
121&up	1	5	
Total	195	226	

TABLE NO. - 42

**TABLE SHOWING THE PERIOD IN YEARS FOR WHICH A TREE REMAINS
IN GIRTH CLASS**

Class	Girth Class in cm	Years in class	Symbol
A	B	C	D
	91&up		
I	76-90		
II	61-75	9	Y ₂
III	46-60	8	Y ₃
IV	31-45	12	Y ₄
V	16-30	12	Y ₅
Total enumeration period		41	Y

Percentage of trees of different size classes that will attain exploitable size and silviculturally available for removal will be as follows in table

TABLE NO. -43

Class	Girth Class	Trees/ha	Symbol	% of trees available as Class I	Symbol	Trees available as Class I	Symbol
A	B	C	D	E	F	G	H
	91&up	12					
I	76-90	17					
II	61-75	26	S ₂	65%	x ₂	16.9	S ₂
III	46-60	40	S ₃	43%	x ₃	17.2	S ₃
IV	31-45	52	S ₄	33%	x ₄	17.2	S ₄
V	15-30	48	S ₅	35%	x ₅	16.8	S ₅
	Total	195				68.1	S

As the total recruitment for the enumeration period Y is S the mean yearly recruitment S/Y , say R is $68.1 / 41 = 1.66$ per ha. The average annual recruitment during the size class period namely, $S_2/Y_2 = R_2$, $S_3/Y_3 = R_3$, ... will be as follows in table no-6

TABLE NO. - 44

Class	Girth Class in cm	No of trees / ha	Years in class	Symbol	Annual recruitment to next class	Symbol
A	B	C	D	E	F	G
	91&up	12				
I	76-90	17				
II	61-75	26	9	Y ₂	1.88	R ₂
III	46-60	40	8	Y ₃	2.15	R ₃
IV	31-45	52	12	Y ₄	1.43	R ₄
V	15-30	48	12	Y ₅	1.40	R ₅
		195	41	Y	1.66	R

It is obvious that although there is stock in hand of 29 class I trees/ha and there will be a recruitment of 68.1 trees/a in the 41 years and thus theoretically annual yield of $(68.1 + 29) / 41 = 2.37$ trees/ha is obtainable. In practice, as the existing stock is assumed

to be distributed uniformly and one ha of the forests to be worked in a year, the total class I trees available in it at the end of the first year will be only $(S_1 + R_2)$.

Of these, all the S_1 existing class I trees will be available for removal, but when felling proceed from one end of the annual area to the other, only half of the recruitment of $R_2/2$ trees that will come into class I in one year over the whole coupe, will be realizable, remaining trees will be passing into class I after the fellings have gone past a particular spot. In other words the total realizable yield from the years coupe will be only $\{S_1 + R_2/2\}$ trees / ha. Similarly when 1st coupe area is gone over in the second year, for 2nd coupe, before fellings commence it will have in it S_1 of existing class I trees as also one year's recruitment namely, R_2 trees, all of which will be available for removal. Besides this as in Coupe I one-half of the year's recruitment $R_2/2$ will also be available. Thus in 2nd coupe trees available per ha would be $\{S_1 + R_2 + R_2/2\}$. And so on.

Thus for one ha area of each coupe, realizable and accumulating Class I for entire felling cycle trees would be as follows in table no-5

TABLE NO. - 45
FOR PROPOSED PLAN FELLING CYCLE OF 20 YEARS; 'N' TH YEAR OF OPERATION; NUMBER OF TREES PER HA.

Sr No	Coupe No	For coupe area in ha	nth year of operation	Class I at hand= S_1	Realizable Recruitment = $(n-1/2) R_2$	Accruing Recruitment=
1	I	1	1	29	$1/2 R_2 = 0.94$	$9R_2 + 8R_3 + 2R_4 + 1/2 R_4 = 37.69$
2	II	1	2	29	$R_2 + 1/2 R_2 = 2.82$	$9R_2 + 8R_3 + R_4 + 1/2 R_4 = 36.26$
3	III	1	3	29	$2R_2 + 1/2 R_2 = 4.70$	$9R_2 + 8R_3 + 1/2 R_4 = 34.83$
4	IV	1	4	29	$3R_2 + 1/2 R_2 = 6.58$	$9R_2 + 7R_3 + 1/2 R_3 = 33.05$
5	V	1	5	29	$4R_2 + 1/2 R_2 = 8.46$	$9R_2 + 6R_3 + 1/2 R_3 = 30.90$
6	VI	1	6	29	$5R_2 + 1/2 R_2 = 10.34$	$9R_2 + 5R_3 + 1/2 R_3 = 28.75$
7	VII	1	7	29	$6R_2 + 1/2 R_2 = 12.22$	$9R_2 + 4R_2 + 1/2 R_3 = 26.60$
8	VIII	1	8	29	$7R_2 + 1/2 R_2 = 14.10$	$9R_2 + 3R_3 + 1/2 R_3 = 24.45$
9	IX	1	9	29	$8R_2 + 1/2 R_2 = 15.98$	$9R_2 + 2R_3 + 1/2 R_3 = 22.30$
10	X	1	10	29	$9R_2 + 1/2 R_3 = 18.00$	$9R_2 + R_3 + 1/2 R_3 = 20.15$
11	XI	1	11	29	$9R_2 + R_3 + 1/2 R_3 = 20.15$	$9R_2 + 1/2 R_3 = 18.00$

Sr No	Coupe No	For coupe area in ha	nth year of operation	Class I at hand= S_1	Realizable Recruitment = $(n-\frac{1}{2}) R_2$	Accruing Recruitment= $=$
12	XII	1	12	29	$9R_2+2R_3+ \frac{1}{2} R_3$ =22.30	$8R_2 + \frac{1}{2} R_2$ =15.98
13	XIII	1	13	29	$9R_2+3R_3 + \frac{1}{2} R_3$ =24.45	$7R_2 + \frac{1}{2} R_2$ =14.10
14	XIV	1	14	29	$9R_2+4R_2 + \frac{1}{2} R_3$ =26.60	$6R_2 + \frac{1}{2} R_2$ =12.22
15	XV	1	15	29	$9R_2+5R_3 + \frac{1}{2} R_3$ =28.75	$5R_2 + \frac{1}{2} R_2$ =10.34
16	XVI	1	16	29	$9R_2+6R_3 + \frac{1}{2} R_3$ =30.90	$4R_2 + \frac{1}{2} R_2$ =8.46
17	XVII	1	17	29	$9R_2+7R_3 + \frac{1}{2} R_3$ =33.05	$3R_2 + \frac{1}{2} R_2$ =6.58
18	XVIII	1	18	29	$9R_2+8R_3 + \frac{1}{2} R_4$ =34.83	$2R_2 + \frac{1}{2} R_2$ =4.70
19	XIX	1	19	29	$9R_2+8R_3 + R_4 + \frac{1}{2} R_4$ =36.26	$R_2 + \frac{1}{2} R_2$ =2.82
20	XX	1	20	29	$9R_2+8R_3 + 2R_4+ \frac{1}{2} R_4$ =37.69	$\frac{1}{2}R_2$ =0.94
	Total	15		580	389.20	389.20
			Average	29	19.46	19.46

Thus overall average number trees per ha above selection girth will be $29 + 19.46+19.46 = 67.92$. Out of which available for selection felling would be $29+19.46 = 48.46$. Percentage removal would be $48.46*100/67.92 = 71\%$. Following the Guidelines of Government of India regarding the removal of 50% of normal available yield, the average annual yield will be 35.5%. For sake of simplicity say 35% of silviculturally available tree i.e. on average 35% of $48.46 = 16.96$ say 17 trees per ha. In terms of number, 35 out of 100 silviculturally available trees will be marked for felling. Taking form factor of tree in girth class 76-90 as timber = 0.173 cubic meter, we will have average yield per ha of worked coupe = 5.86 cubic meterS. We will have average annual yield = $22604.25 \times 5.86/20 = 6623.04$, **say 6,600 cubic meter per year** if all coupes of the working cycle are worked annually. The revision of working plan is contemplated after 10 years, whatever the stock at hand will be taken as safe guard from the excess removal. In the Selection Cum Improvement coupe the removal of prescribed yield will be having selection trees in the form of occumulated

trees and some balance trees. Therefore the structure and composition of crop is maintained after removal of selected trees and sustainable yield is ensured in perpetuity. Since the number of trees as well as yield is varying, it is not possible to give exact yield for coupe. The yield will be estimated only after carrying out 100% enumeration of the trees above selection girth. The yield is also vary depending upon the site quality accordingly the yield will be calculated.

As the percentage of teak in the composition of crop is 46%, it is recommended to increase the composition of non teak crop to increase biodiversity. Hence, no non teak species should be felled.

SECTION II.14 : AGENCY OF HARVESTING :

II.14.1 The coupes shall be worked departmentally or through Labour Co-operative Societies or as per the directives and policy of the Government.

SECTION II.15 : METHOD OF EXECUTING THE FELLING :

II.15.1 DEMARCATION : The main annual coupes due for felling will be demarcated one year in advance except coupe no. I due for working in which demarcation and marking will be carried out in the same year of working. Demarcation and marking will be carried out as per the prescriptions in miscellaneous regulations. The coupes will be divided into 4 sections for effective control over various operations like felling, extraction and other treatments. Each section shall not exceed not more than 20 ha. leaving section line between two sections.

II.15.2 PREPARATION OF TREATMENT MAP : After demarcation of the coupes, a treatment map will be prepared by the RFO and it will be verified by the ACF emphasizing for the areas of promising natural regeneration, site suitable for plantation and the area which need Soil and Moisture Conservation works. The treatment map shall be approved by the Dy.C.F after having detailed discussion with concerned RFO and ACF and field inspection. The treatment map shall be prepared with proper care and all the features must be shown on the treatment map.

The map all compartments showing the details and “A”, “B”, “C”, “D” category have been given in the Volume II of working plan to assist the officer while preparing treatment map for each coupe.

The treatment map shall indicate the following details:

1. Category “A”- Protection Areas :- It shall include the following areas :

- i. Areas with steep slopes i.e. more than 25°.
- ii. 20 meter wide strip on either side of the water courses.
- iii. Eroded or liable to erosion areas.
- iv. The area which directly drain into water reservoirs of the irrigation or drinking water projects.

2. Category “B”- Under stocked area :- This includes area with crop density less than 0.4 or total blank areas and the area shall not be less than 2 ha. in extent at one place.

3. Category “C”- Areas of old plantations and pole crop of NR:- This category include the patches of pole crop and NR suitable for retention as future crop of both teak and miscellaneous patches and successful old plantations having survival more than 30% and extent of which shall be minimum one ha. at one place.

4. Category “D”- Well stocked areas :- The areas having crop density more than 0.4 shall be considered as well stocked areas. In this category the area year marked for over wood removal followed by teak plantation shall be clearly shown on treatment map.

II.15.3 TREATMENT : Different types of treatments are prescribed and adopted for these categories of areas are as under :

The entire coupe area shall treated with soil and moisture conservation measures like nala bunding and gully plugging as per the treatment map.

1. **Category – A or protection areas :** No felling is prescribed.
2. **Category – B or under stocked areas :**

- i. Dead trees shall be removed leaving 2 trees per ha. for wild life (snags and dens)
 - ii. Teak and miscellaneous species will be planted as per the suitability of site.
- 3. **Category – C**
 - i. No plantation will be done in these areas.
 - ii. Marking for thinning shall be done in the young pole crop as per the stand table.
- 4. **Category - D**
 - i. No Planting will be done.
 - ii. Felling will be carried out as prescribed under marking rules.

SECTION II.16 : MARKING TECHNIQUES AND MARKING RULES :

Marking will be done under close supervision of ACF with guidance of Dy.C.F concerned. The Dy.C.F. will himself inspect as many coupes as possible and impart proper guidance and instruct the staff so as to avoid any deviations of the prescription of the treatment.

1. Category “A” area – No marking is prescribed in these areas, only soil and moisture conservation works, gap planting and seed sowing with suitable species as per the requirement of site will be carried out in the under stocked areas.

2. Category “B” area:- Felling marking if needed shall be carried out as per the marking rules given :

- i. All dead trees except 2 trees per ha. shall be marked for felling
- ii. All live stumps shall be cut closed to the ground and properly dressed.

- iii. Malformed seedlings shall be cut back, and established coppice shoots and poles shall be reduced to one per stool retaining most promising one.
- iv. The unwanted under growth which is preventing or likely to prevent the development of seedling regeneration of the desired species will be removed.
- v. In these areas, planting in 5-10 ha. of continuous patches may be undertaken for gap planting by suitable species as per the site conditions on such patches the plantation of 50% teak and 50% miscellaneous shall be taken up.

3. Category “C” area –

- i. No plantations will done in these areas.
- ii. Congested young poles of natural regeneration would be marked for thinning to ensure proper spacement by reducing number of poles per ha. as per stand table.
- iii The dead, dying, diseased and malformed poles will be marked for thinning.
- iv. The multiple poles will be reduced to one per stool retaining vigorous one in the old plantations and young crop. The thinning shall be carried out on the silviculture principles with the help of stand table.
 - a. Age and site quality of crop shall be ascertained.
 - b. Wedge Prism of suitable factor (generally for young crop, middle aged crop, prism with factor one is convenient) is basal area per ha. of the crop is obtained by averaging 3 or 4 counts at various representative sites.
 - c. The basal area as obtained above shall be compared with basal area given in the stand table and if the basal area more than that of given in

stand table for corresponding age and site quality, the crop is fit for thinning.

- d. The additional basal area required to be removed from those girth classes which are having more number of trees as compared to the stand table.
- e. Accordingly marking for thinning is done . for cross checking basal area of the thinning crop again the basal area in to be calculated with the help of wedge prism e. Care should be taken to remove the poles of coppice origin first while retaining the poles of seedling origin.
- f. Unwanted undergrowth which is preventing or likely to prevent the natural regeneration or artificial regeneration shall be removed.

4. Category “D” area –

The marking for felling shall be carried out as per the marking rules.

- 1. All the combers except those of NTFP values shall be cut.
- 2. Multiple coppice shoots or poles shall be marked to reduce, one per stool retaining the most promising one.
- 3. Marking shall be done for felling if the trees are available silviculturally.
- 4. The teak tree preferably of coppice origin and that of harvestable girth and above shall be marked for felling as prescribed in miscellaneous regulations. Those harvestable teak trees, which are preventing the development of the seedling regeneration of the desired species, will be removed in preference to others. It is prescribed that 50% of all the teak trees matured above exploitable girth and silviculturally available shall be marked for felling. The sound teak trees of seedling origin shall be retained first.

5. The felling of that trees from highest girth class to nest lower girth class. Appropriate care should be taken to remove teak trees of coppice origin in preference to teak trees seedling origin as far as possible.
6. No sound miscellaneous trees including the trees, which yield edible fruits, and important non-wood forest produce shall be marked for felling so as to improve the stock in the forests.
7. All the dead trees will be marked for felling retaining 2 per ha.
8. All malformed, diseased and dying trees will be marked for felling. It is prescribed that (malformed trees having straight clear bole exceeding 2.5 meters in height from the ground level will not be felled. A malformed trees with a badly shaped and defective stem occupying more space than its future value warrants.
9. The unwanted undergrowth which is preventing or likely to prevent the establishment and development of seedling regeneration of the desired species will be removed.

SECTION II.17 : SOIL AND MOISTURE CONSERVATION WORKS :

II.17.1 : The forest of Pusad Division suffered from frequent fires, heavy biotic pressure and excessive cattle movement resulted in compaction of soil poor soil aeration and poor drainage. These soil conditions are not conducive to establish young recruits therefore they die before getting established. To bring about conducive site conditions for establishment of seedlings, the soil and moisture conservation (Contour trenches, Nala bunding, Inverted bandhara, Cement plugs etc.) measures have been prescribed. The contour interval between the consecutive trenches will be 1.5 mtr. The distance

between two consecutive continuous trenches will vary based on slope pattern as given under:

Slope	Distance
0 to 10	10mt
10 to 25	5mt
Above 25	3-4mt

II.17.2 : The various models prescribed by Department of Soil Conservation as per Agro-Climatic Conditions suitable to local sites as per its slope and rainfall in the area selected for regeneration shall be the bench mark for carrying out contour trenching works in the forest areas. In general the average total length of trenches is approximately 1000 to 1200 RMT in these areas. Gully plugging and Nalah bunding shall be on the basis of watershed i.e. from ridge to valley, shall be done to the extent 30 to 40m³ per ha. and it may very depend on the site requirements. These works shall be undertaken in the upper reaches and undulating areas preferably.

SECTION II.18 : SUBSIDIARY SILVICULTURAL OPERATIONS :

II.18.1 : CBO:- The cutting back operations will be carried out one year after the main felling of the coupes. The following prescriptions are given to carry out these operations.

1. The badly damaged trees during the main felling shall be felled.
2. Cutting of the climbers except those of known medicinal or NWFP value.
3. All left over established multiple coppice shoots and the poles will be reduced to one per stool.
4. Newly raising multiple teak coppice shoots will be reduced to two per stool retaining the most promising ones.
5. The trees marked for felling but left out during the main felling shall be felled.

II.18.2 : CLEANING :- It shall be carried out during the 6th year of the main felling as per the following prescriptions :

1. Climbers cutting shall be under taken except those known for medicinal and NWFP value.
2. Multiple coppice shoots shall be reduced to one or removed if found interfering with the establishment of natural regeneration.
3. The established natural regeneration of teak and miscellaneous species shall be thinned for appropriate spacing
4. All the inferior species including undesirable undergrowth interfering or likely to interfere with growth and development of seedling of teak and other valuable species (Including medicinal and NWFP) will be cut back.

II.18.3 : THINNING :

Thinning will be carried out in old plantation as per the details given in Para as given in page no 268.

SECTION II.19 : REGENERATION :

II.19.1. Natural Regeneration :

The young recruits of seed origin are noticed in patches of both teak and miscellaneous species and usually die before getting established due to bad edaphic conditions resulted by excess biotic pressure and recurrent fires.

To increase the development and establishment of natural regeneration and to induce the natural regeneration, the prescriptions given below shall be followed

1. The areas containing promising natural regeneration shall be identified inside the coupe.
2. The undesirable undergrowth which is preventing or likely to hinder the establishment and development of young recruits of seed origin of the desired species will be removed.

3. The identification patches of natural regeneration should be rigidly protected from fire, grazing and other biotic interference.
4. The coppice shoots of both teak and miscellaneous species which interfering with the young seedlings shall be removed.
5. The young seedlings shall be treated with soil working and soil mulching in each year in first 3 years after main felling. The soil and moisture conservation works shall be taken up in such identified patches if needed.
6. The natural regeneration should be cleared-off weeds within the diameter of one meter and these weeds, grasses, leaf litter, leaves, twigs and branches will be spread in a 15 cm. high layer all around the seedlings within the cleared area so that it will act as organic mulch. 2 or 3 spade full of soil to each plant shall be added over it to keep it in place. So that it will keep the soil around the plants free from weeds as well as helping proper aeration of the soil by worms and insects. Apart from this mulching small stones around the current year recruits shall be arranged in the areas where stones are available. In plantation small stone will be arranged in a circle around the seedlings and this process will help in retention of surface moisture and avoid accidental trampling by cattle or others.

II.19.2. Artificial regeneration and choice of species :

Supplemented to the natural regeneration, artificial regeneration is prescribed as per the site requirement. The choice of species shall be based on site conditions and preference of local community. In this contest it is preferred to select the species of indigenous, naturally occurring and of proven fodder, fruit, non wood forest produce. The species shall be selected in consultation with local people or the members of JFMC. Some of indigenous and preferred species are Arjun, Dhaoda, Bel, Behda, Bamboo, Chinch, Jamun, Apta, Anjan, Biba, Hirda, Kulu, Shivan, Tiwas, Ber, Amba etc. In general, in the plantations 50% teak and 50% miscellaneous species shall be raised. Bamboo can be planted along the Nallah and approximately 20% species shall be selected among the miscellaneous species which will be of fuel-wood, fodder and fruit value. The stump, poly-pot or root trainer seedlings based on performing in the

adjoining similar areas and availability can be used. The seedlings so raised from source of seed origin preferably obtained from known source especially from plus trees of high forests.

II.19.3. Method of Planting : In the areas of plantation the spacing will be 2 x 2 mtr. For planting teak stumps alignment and stocking will be carried out & stumps will be planted in crowbar hole. For root trainer teak seedlings pit size of 30 x 30 x 30 cms. will be dug and plants will be planted. Misc. plants will be planted with poly pot seedlings in pits of size of 30 x 30 x 30 cm.

II.19.4 WEEDING & CASUALTY REPLACEMENT :- 3 weeding are prescribed in 1st year, 2 weedings in 2nd year & 1 weeding in 3rd year. Casualty replacement if necessary shall be carried out in 1st & 2nd year to the extent of 20%. Soil working & soil mulching shall also be undertaken along with each weeding. Application of organic & inorganic fertilizer shall be undertaken & the quantity & number of application shall be decided on the basis of site requirement.

The plant population of both natural regeneration and artificial regeneration should be kept around 1000 seedlings per hectare. The pit size shall be of 30x30x30cm for poly pots seedlings. While digging pits care should be taken not to dig pit in the shadow of standing tree or 2 meter of existing established seedlings. The standing trees are having influence zone of spreading shadow and pits should not dig either in the shadow or in the influence zone of a standing tree. Influence zone for various size trees may be taken as given in the table below :-

TABLE NO. -46

TABLE SHOWING THE ZONE OF INFLUENCE

Sr. No.	Girth Class in Cms.	Influence zone in mt.
1	<30	2.0
2	30-60	3.0
3	60-90	4.0
4	90-120	5.0
5	>120	6.0

SECTION 20 : PRE PLANTING AND PLANTING OPERATION : Various operations of pre planting and planting have been discussed in details in **Section 14 of Afforestation Working Circle Chapter IV** shall be followed.

SECTION II.21 : OTHER REGULATIONS :

II.21.1. Fire Protection : The main felling coupes shall be fire traced and rigidly protected from fire for a period of 5 yrs. separately. The areas identified for fire protection will be cleared off, of all the dry and cut remains of bushes, leaves etc. by end of February to avoid fire hazards to standing crop as well as to the NR. Effective protection against fire shall be under taken for a period between Feb. 15 to June 15 to ensure survival and establishment of NR of all species for developing it into the future growing stock. In order to ensure effective protection of these areas Joint Forest Management Committees shall be assigned the works of fire tracing and fire protection. A separate and comprehensive fire fighting scheme will be chalked out, the details of which are given the 'Miscellaneous Regulations'.

II.21.2. Grazing : The coupe of main felling will be closed to grazing for a period of 5 years from the year of main felling. During the time of plantation the under stocked areas of each coupe shall be shown with the seeds of fodder grasses like Sheda, Paunya etc. so that by the time of coupe is opened after a closure of 5 years, it will have enough fodder of good quality. The villagers will be encouraged to harvest the fodder on rotational harvesting basis from such coupes.

CHAPTER III

WORKING PLAN FOR THE CATCHMENT AREA TREATMENT WORKING CIRCLE

SECTION III.1.-GENERAL CONSITUTION.

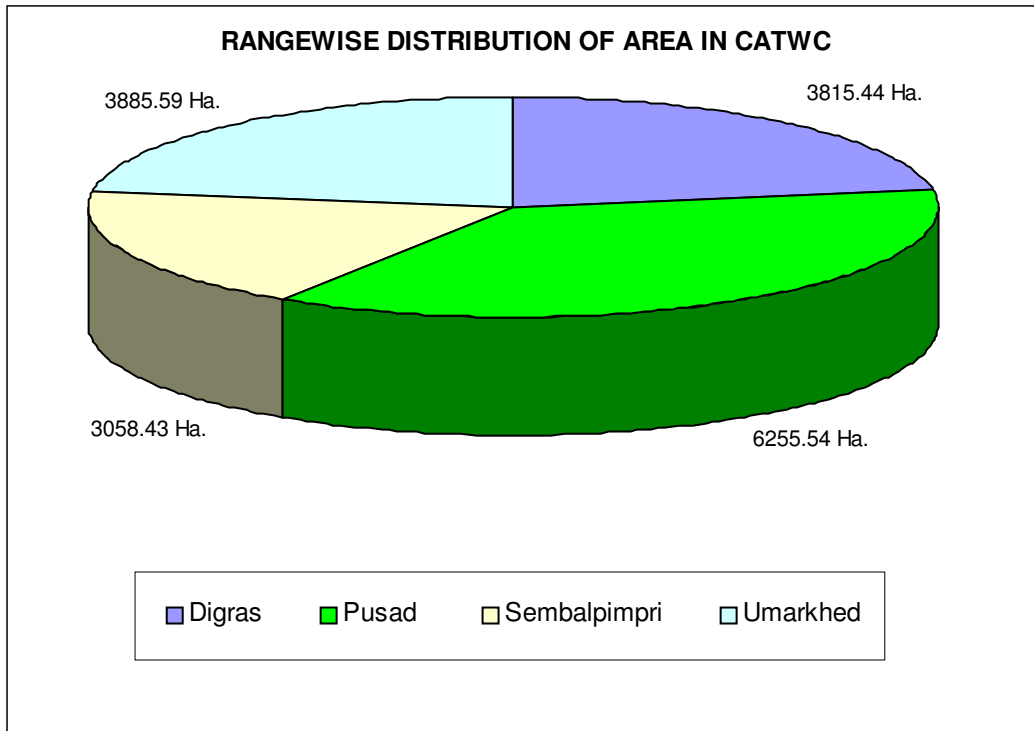
This working circle includes the forest areas falling in the catchment areas of different major, medium and minor irrigation projects and also drinking water projects which are directly draining into the reservoirs and water bodies. The 'C' class reserve forest falling in the catchment areas of irrigation and drinking water projects having the area more than 200 Ha. The forest areas included in this working circle were managed under coppice with reserve, plantation, improvement, pasture, fodder reserve and misc. working circles in the past.

In Gupta's plan these forest were managed under catchment area treatment working circle and there is no visible improvement in the vegetation cover as per the observations. The extent of area included in this working circle is 17015.00 ha.

TABLE NO. -47

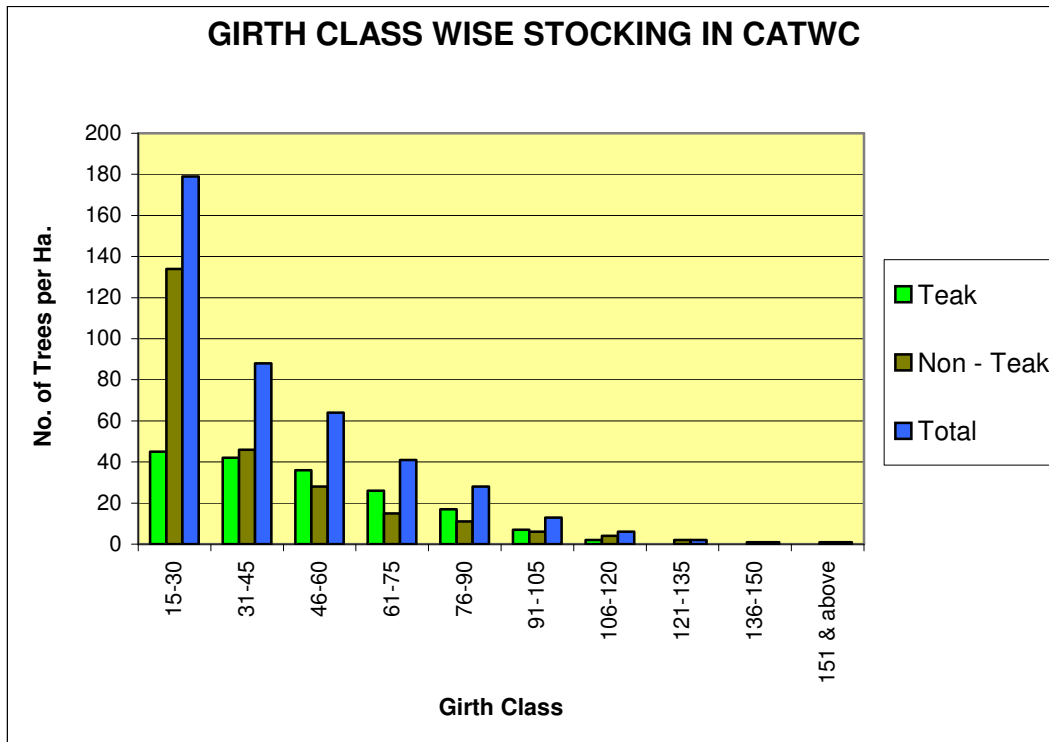
RANGEWISE AND CATEGORYWISE DISTRIBUTION OF AREA TO CATCHMENT TREATMENT WORKING CIRCLE

Sr N.	Range	Area of the Range (ha)	Area allotted (ha.)				% to the area of the Range	% to the area of WS
			RF.	PF.	UF	Total area		
1	Digras	16392.93	3815.44	---	-	3815.44	23.27	22.42
2	Pusad	16828.97	6117.43	138.11	-	6255.54	36.35	36.77
3	Shembalpimpri	12728.70	3011.52	46.91	-	3058.43	24.03	17.97
4	Umarkhed	11222.45	3885.59	---	-	3885.59	34.62	22.84
5	Mahagaon	10293.78	---	---	-	---	---	---
6	Bittergaon	1968.43	---	---	-	---	---	---
	Total	69435.26	16829.98	185.02	-	17015.00	19.71	100.00



SECTION III.2.GENERAL CHARACTERS OF VEGETATION: -

These forests are well stocked in some patches and are under stocked with open patches in other areas. The 'C' class reserve forest assigned to this working circle is mainly of open type with little or no vegetation. Most of these areas represent Stunted tree crop, which falls in the local sub type of "poor quality teak forest or degraded scrub forest." The principal species is Teak along with its natural associates such as Ain, Dhawda, Salai, Char, Tendu, etc. The soil is compact with little soil moisture and poor aeration. The natural regeneration is scanty and the young recruits of Teak and its major associates are noticed in many compartments in patches but they die back without getting established. Poor soils, intolerable biotic pressure, recurrent fires and lack of appropriate protection are mainly responsible for poor natural regeneration in these forests. The density of the forest varies from 0.1 to 0.6 and the crop mostly young to middle age. The site quality in general confirms to IV B.



SECTION III.3:- SPECIAL OBJECTS OF MANAGEMENT :-

Intensive soil and moisture conservation works to check the soil erosion and to arrest the runoff in the forest catchment areas.

Effective drainage treatment to check the silt flow into the water reservoirs. To preserve and increase vegetal cover through the majors of appropriate treatment to enhance the ground water table.

SECTION III.4 :- BLOCKS AND COMPARTMENTS :-

The compartments proposed to be assigned to this working circle and other necessary details are as under.

TABLE NO. -48

**ALLOTMENT OF THE COMPARTMENTS TO VARIOUS FELLING SERIES IN
CATCHMENT TREATMENT WORKING CIRCLE**

Sr No.	Range	Working Series		Compartment allotted	Area (ha)	Total area of the W.S.	Total area allotted from each Range (ha)
1	Digras	2	Digras-Chondi	339, 769, 772, 783, 773A, 773B, 774, 775, 776, 785.	1477.01	1477.01	3815.44
		3	Harshi	340, 779, 780, 782, 784	1261.56	1261.56	
		4	Sakri	341, 342, 343, 781	1076.87	1076.87	
2	Pusad		Ansing	365, 366, 370	819.22		6255.540
		7	Pandhurna	353, 385, 386, 387	1408.04	1408.04	
		8	Marwadi	391, 392, 396, 382	1119.60	1119.60	
		9	Urdu	378, 379, 380, 381, 822, 823, 376, 377	1910.30	1910.30	
		10	Boradi	368, 369, 827, 828, 829, 830, 831, 832	998.38	998.38	
3	Shembal-pipri	1	Ansing	409, 410, 411,	469.96	1316.18	3058.43
		5	Dhansal	403, 404, 407, 408, 751, 839,	1299.25	1299.25	
		6	Amdari	415, 834, 836, 837, 412, 842, 846, 843	1262.22	1262.22	
4	Umarkhed	11	Senad	424, 425, 426, 427,	1350.17	1350.17	3885.59
		12	Marsul-Mudana	432, 433, 443, 444.	1208.00	1208.00	
		13	Piranji-Nignoor	450, 462, 463, 465, 466	1327.42	1327.42	
	Total	13 Felling series		76 Compartments	17015.00	17015.00	17015.000

SECTION III.5 :- ANALYSIS AND VALUATION OF CROP :-

The stock map which are already in existence are updated. These stock maps are assessed with the help of satellite imaginaries and adequate ground truth had been carried out to confirm and update stocking. The enumeration of the forest undertaken by the SOFR unit of Amravati and the data obtained is analyzed. The results of same is given in the below mentioned table.

TABLE NO. - 49

THE ENUMERATION DATA RESULTS OF C.A.T. WORKING CIRCLE

Sr. No.	Name of Working Circle	Area percentage	Total area in ha.	Density / % to the w.c. area			Blank
				0.6 & above	0.4 to 0.6	0.1 to 0.4	
1	Catchment Area Treatment W.C.	24.50%	17015.00	0 (0%)	7437.13 (43.71%)	8126.01 (47.76%)	1451.86 (8.53%)

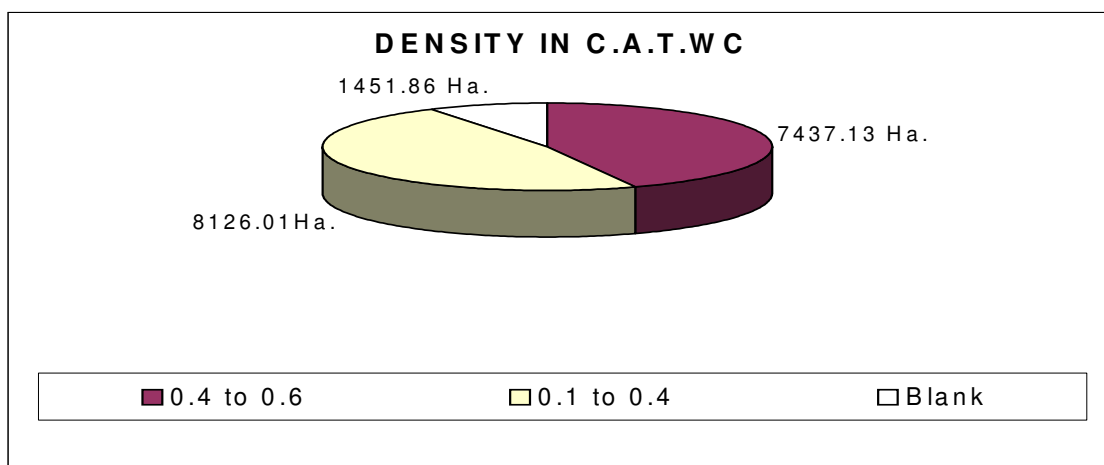


TABLE NO. -50

ENUMERATION DATA (GIRTH CLASSWISE) IN C. A.T.W.C.

Sr.No	Girth Class	Teak			Others			Total	
		No.	%age wrt Total teak spp.	%age wrt Total stock.	No.	%age wrt Total Misc. spp.	%age wrt Total stock.	No.	%age wrt Total stock
1	15-30	45	25.71	10.64	134	54.03	31.68	179	42.32
2	31-45	42	24.00	9.93	46	18.55	10.87	88	20.80
3	46-60	36	20.57	8.51	28	11.29	6.62	64	15.13
4	61-75	26	14.86	6.15	15	6.05	3.55	41	9.69
5	76-90	17	9.71	4.02	11	4.44	2.60	28	6.62
6	91-105	7	4.00	1.65	6	2.42	1.42	13	3.07
7	106-120	2	1.14	0.47	4	1.61	0.95	6	1.42
8	121-135	0	0	0	2	0.81	0.47	2	0.47
9	136-150	0	0	0.00	1	0.40	0.24	1	0.24
10	151&above	0	0	0.00	1	0.40	0.24	1	0.24
	Total	175	100	41.37	248	100.00	58.63	423	100.00

SECTION III.6 :- SILVICULTURAL SYSTEM/ METHOD OF TREATMENT :-

The areas allotted to this working circle are those which falls in the catchment limitations of different irrigation projects and the areas shall be completely protected irrespective of its crop density, composition, etc. No felling shall be carried out in the area except removal of dead trees only. The natural regeneration shall be boosted with appropriate tending operations and supplemented by artificial regeneration with suitable species, wherever required to increase the vegetation cover in the catchment areas. The

healthy coppice regeneration will be retained depending upon the site requirement and quality of coppice. Suitable soil and moisture conservation measures along with the afforestation must be taken up in order to prevent further soil erosion, siltation of reservoirs and to enhance the ground water level. For the purpose of treatment the forest areas of this working circle shall be divided into following categories.

1. Category A : Protection Areas :-

Steep slopes above 25°, erosion prone areas and 20 mtrs. on both the side of perennial water course.

2. Category B : Under Stocked Areas :-

Areas with density less than 0.4.

3. Category C : Pole Crop and Old Plantation Areas :-

The established natural regeneration with pole crop and old plantation areas having more than 30% survival and the area of 1 ha. in extent of one place are included in this category.

4. Category D : Well stocked areas :-

Areas having crop density more than 0.4 are included in the type. The treatment map shall be prepared by the Range Forest Officer under the guidance of ACF and it shall be approved by the Dy. Conservator of Forests. In all above categories of area suitable soil and moisture conservation measures as per the site requirements shall be undertaken such as Nala bunding, Check dams, Cement plugs, etc. The treatment will be on watershed basis, i.e. from ridge to valley.

Various treatments proposed for the above mention areas are as follows.

1. **Category A :-** Soil and moisture conservation work shall be taken up in chapter on miscellaneous regulations. Teak and suitable miscellaneous species shall be planted in the gap areas as per site requirement followed by Bamboo under planting in 4th year and seed dribbling of the species of soil biuders shall be undertaken.No felling will be done.

2. **Category B :-** Soil and moisture conservation shall be taken as given in misc. regulations. Plantation of teak and suitable misc. species as per the suitability of site followed by Bamboo under planting in the 4th year and seed ling with suitable species are prescribed.

3. **Category C :-** No plantations will be taken up in these areas.

Marking for thinning shall be done in the young pole crop and the old plantation to bring about appropriate spacemen as per stand table.

4. **Category D :-** No felling except dead trees removal and no plantations shall be undertaken, Two dead trees per ha. shall be retained for snags and dens.

SECTION III.7:- FORMATION OF PLANTATION SERIES AND COUPES:-

The allotment of areas to various coupes is given in Appendix no. XLIII(B) of Volume II.

SECTION III.8 :- REGULATION YIELD :-

No yield is expected from these areas. The coupes will be laid in such a way so that equal area is made available for each year for drainage and other treatments.

SECTION III.9 :- IMPLEMENTING AGENCY :-

Forest Department shall implement all the operations in this working circle.

SECTION III.10 METHOD OF EXECUTING THE FELLINGS :-

III.10.1. The coupes will be demarcated one year in advance of the working.

III.10.2. Marking Rules :- The marking will be done by an officer not below the rank of Range Forest Officer.

III.10.3. In the category A,B, and D all the dead trees will be marked except 2 trees per ha. which will act as Snags and Dens for wild life, whereas in category C

thinning marking shall be done for appropriate spacement as per the stand table. No marking shall be done for removal of any tree except mentioned above.

SECTION III.11 :- REGENERATION :-

III.11.1. Existing regeneration shall be properly protected and soil and moisture conservation shall be taken up. The established seedlings shall be treated with soil working and mulching in order to boost the growth of seedlings. In the protection and under stocked areas the natural regeneration shall be supplemented by artificial regeneration. Misc. Plantation with teak shall be undertaken as supplement to natural regeneration in such areas. Seed dribbling suitable species soil binders shall be undertaken. While taking plantations, indigenous species, naturally occurring and of proven, fodder, fruit and non wood forest produce value shall be preferred. Some of such species are Babhul, Khair, Neem, Glyrisidia, Teak, Arjun, Dhawda, Chinch, Jamun, Ber, Apta, Anjan, Biba, Bamboo, Behada, Hirda, etc. The collectable grass species like Sheda, Pauniya, Marvel shall be under taken.

Bamboo shall be planted in the 4th year of the plantation specially along the Nalas. Care shall be taken at least 20 % species of Misc. will be of fuel and fodder. The superior quality of stumps poly-pot or Root trainer seedlings depending upon their performance can be used. The seed for raising such planting stock should be from known source specially from plus trees of high forests.

The total plant population of both natural regeneration and artificial regeneration shall be around 1000 per ha. For poly-pot plantation pits of 45 X 45 X 45 cms shall be dug. No plantation should be undertaken either in the shadow or influencing zone of standing tree or 2 mtrs of existing established seedlings. Teak stumps and seedlings shall be planted in the 1st week from the out brake of mansoon showers and the other species after food rains.

The planting operations shall be completed within time frame.

The post planting operation shall be carried out as prescribed in afforestation working circle.

SECTION III.12. :- OTHER REGULATIONS :-

III.12.1. Fire Protection :- The coupes and main plantation shall be fire traced and the rigid fire protection measures shall be undertaken. The areas will remain closed to grazing for the period of 5 years from the year of planting. Fire tracing and fire protection works shall be accent to JMFC's.

III.12.2. Raising of Fodder :- Broad casting of collectable grass seeds such as Sheda, Marble and Pauniya shall be undertaken in the restorative phase to improve the soil moisture. Protection of soil and to make fodder available to cattle of local villagers.

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CHAPTER IV

WORKING PLAN FOR THE AFFORESTATION WORKING CIRCLE

SECTION IV.1: GENERAL CONSTITUTION:

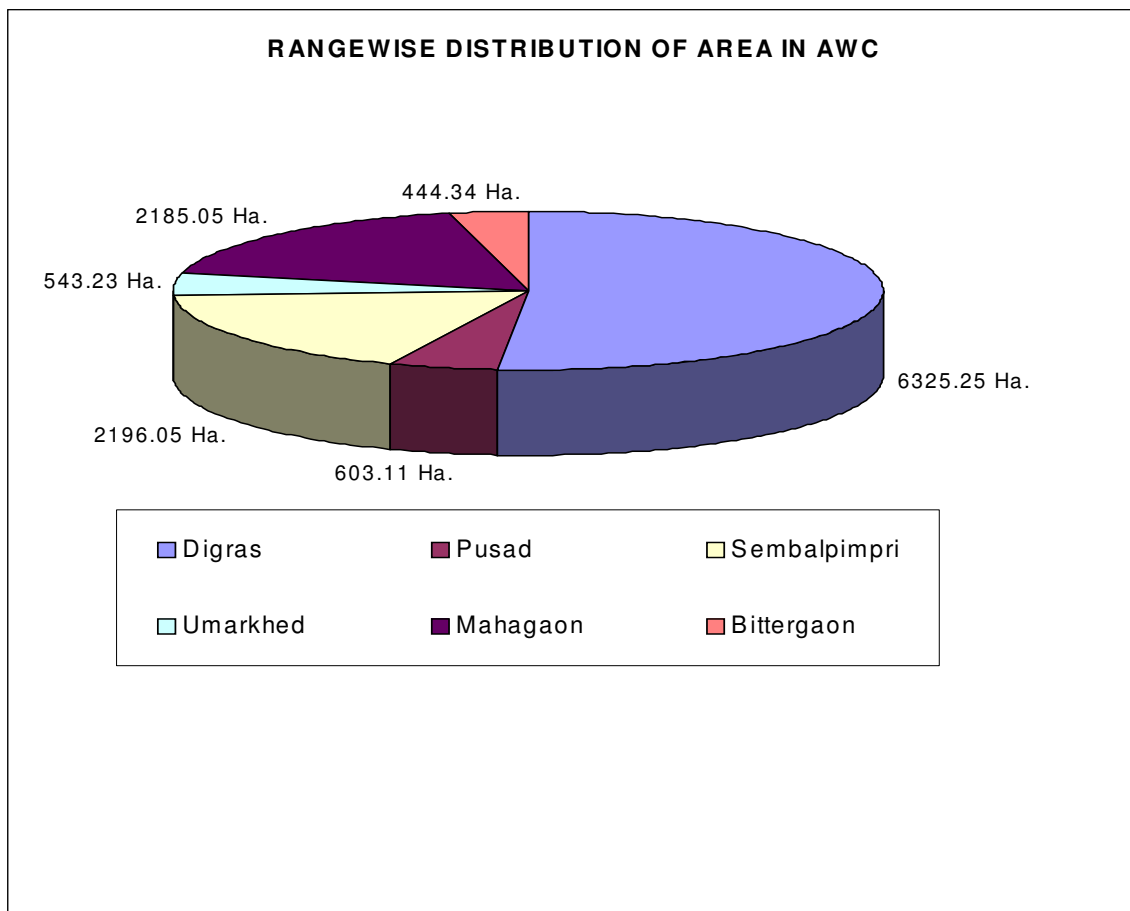
IV.1.1 This working circle comprises the following Forest areas:

- i. Major portion of the 'C' class reserve forest outside the catchments areas of various of irrigation projects, part areas of misc. working circle, coppice reserve, Pasture improvement, plantation and fodder reserve working circle of past management plans.
- ii. Areas included in afforestation working circle of Gupta's working plan The forest area included in this working circle is about 12297.03 Ha. of entire division.

TABLE NO. -51

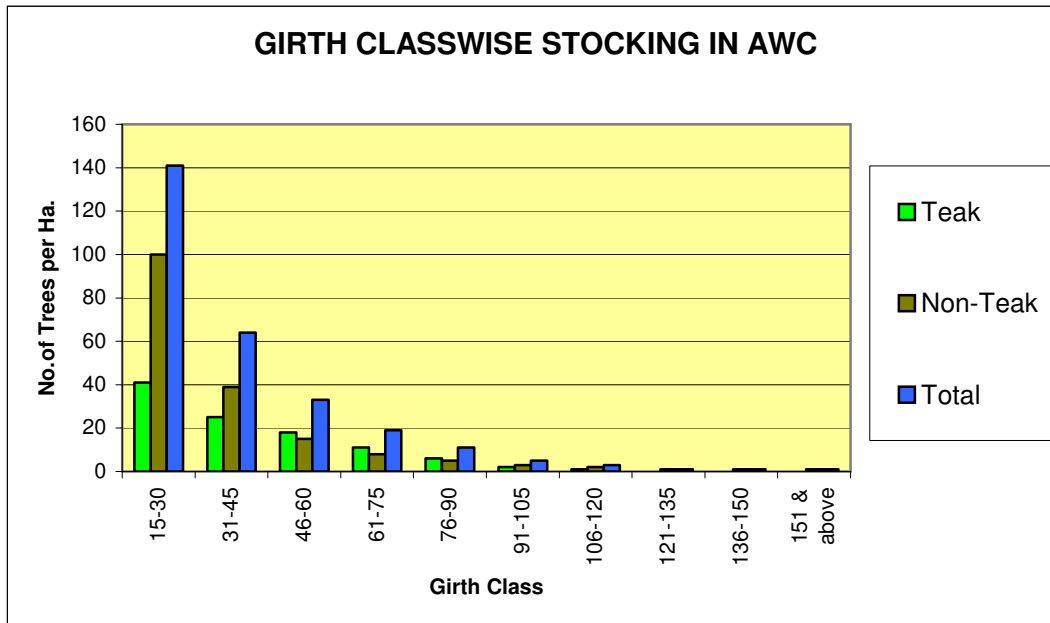
RANGEWISE AND CATEGORYWISE DISTRIBUTION OF AREA IN AFFORESTATION WORKING CIRCLE

Sr No	Range	Area of the Range (ha)	Area allotted (ha.)				% to the area of Range	% to the area of WS
			RF.	PF.	UF	Total area		
1	Digras	16392.93	6325.25	---	-	6325.25	38.59	51.44
2	Pusad	16828.97	372.04	231.07	-	603.11	3.58	4.90
3	Shembalpipri	12728.70	2162.91	14.56	18.58	2196.05	17.25	17.86
4	Umarkhed	11222.45	543.23	---	-	543.23	4.84	4.42
5	Mahagaon	10293.78	2164.25	20.80	-	2185.05	21.23	17.77
6	Bittergaon	1968.43	384.46	---	59.88	444.34	22.57	3.61
	Total	69435.26	11952.14	266.43	78.46	12297.03	18.01	100.00



SECTION IV.2: GENERAL CHARACTERISTICS OF VEGETATION:

IV.2.1 The areas which are allotted to this working circle in general are under stocked and open with crop density mostly less than 0.4. However some of the better stocked patches are also noticed in some compartments. The site quality is poor which represents from IV A to IV B. Teak constitutes as the major species along with its principal associates such as Ain, Dhawada, Char, Tendu, etc. in these forest areas. The soil is compact with little or no soil moisture or sub soil moisture and highly impoverished due to heavy grazing pressure. The status of natural regeneration is poor, the young recruits of Ain, Teak, Dhawada are observed in many compartments but they die back without getting established. Lack of appropriate protection, excessive biotic pressure non-conducive soil conditions and the climatic conditions are major responsible factors for poor natural regeneration.



SECTION IV. 3: SPECIAL OBJECTS OF MANAGEMENT :

IV.3.1 To improve the vegetal cover in the area to bring about improvement in Forest quality and composition.

IV.3.2 To check the loss of top soil by taking up appropriate soil and moisture conservation measures to increase porosity of the soil in order to improve water absorption capacity.

IV.3.3. To increase productivity of the land to meet the demands of local people for fuel, fuel wood, fodder and minor timber.

IV.3.4 To improve the availability of non wood forest produce and employment opportunities in this areas in order to provide the means of livelihood to the local people.

SECTION IV. 4: BLOCKS AND COMPARTMENTS :

IV.4.1. **Seventy three** compartments are allotted to this working circle formed into **Twelve** felling series and each felling series is divided into **Twenty** coupes. The details of the compartments allotted to this working circle along with the felling series formed are given below.

TABLE NO. -52

**ALLOTMENT OF THE COMPARTMENTS TO VARIOUS FELLING SERIES IN
AFFORESTATION WORKING CIRCLE**

Sr No	Range	Working Series		Compartment allotted	Area (ha)	Total area of the W.S.	Total area allotted from each Range (ha)
1	Digras	1	Amala-Tuptakli	777, 778, 786, 787, 788, 789	881.44	881.44	6393.25
		2	Itala	798, 799, 800, 801.	1202.99	1202.99	
		3	Chichpad	337, 338, 795, 796, 797, 770A, B.	1405.70	1405.70	
		4	Hiwalani	330, 331, 790, 791, 792, 793, 794.	1583.47	1583.47	
		5	Sakhra	767, 768, 802, 803, 804, 805, 806, 807,	1319.65	1319.65	
2	Pusad	6	Aregaon	747, 748, 825, 826.	603.11	603.11	603.11
3	Shembal-pipri	7	Dhanaj	849, 856, 857, 858, 860, 861, 862	764.24	764.24	2265.25
		8	Botha (pt.)	847, 848, 850, 851, 852, 853, 854, 855, 865(UF), 840B(PF)	1389.48	1593.02	
4	Umarkhed	9	Ambadi-Warudbibi(P)	757, 758, 759.	543.23	543.23	543.23
5	Mahagaon	10	Kasola-Malegaon	333, 335, 809	1044.61	1044.61	2185.05
		11	Sawna-Injani	332, 814, 815, 816, 817, 818.	916.02	916.02	
			Ambadi-Warudbibi(P)	808(P), 811, 819, 820, 866(PF)	224.42	224.42	
6	Bittergaon	12	Tembhi-Pimpalgaon pt.	497, 867(UF).	444.34	444.34	444.34
	Total	12 Felling series		73 comptt.	12297.03	12297.03	12297.03

SECTION IV.5: ANALYSIS AND VALUATION OF THE CROP :

IV.5.1. The existing stock maps are updated the stock is assessed with the help of satellite imagery with adequate ground truth verification. The enumeration survey of the forest crop has already been carried out by the SOFR of Amravati and the results of enumeration survey are given below.

TABLE NO. -53

ENUMERATION DATA (GIRTH CLASSWISE) IN A.W.C.

Sr.No	Girth Class	Teak			Others			Total	
		No.	%age wrt Total teak spp.	%age wrt Total stock.	No.	%age wrt Total Misc. spp.	%age wrt Total stock.	No.	%age wrt Total stock
1	15-30	41	39.42	14.70	100	57.14	35.84	141	50.54
2	31-45	25	24.04	8.96	39	22.29	13.98	64	22.94
3	46-60	18	17.31	6.45	15	8.57	5.38	33	11.83
4	61-75	11	10.58	3.94	8	4.57	2.87	19	6.81
5	76-90	6	5.76	2.15	5	2.86	1.79	11	3.94
6	91-105	2	1.92	0.72	3	1.71	1.08	5	1.79
7	106-120	1	0.96	0.36	2	1.14	0.72	3	1.08
8	121-135	0	0	0.00	1	0.57	0.36	1	0.36
9	136-150	0	0	0.00	1	0.57	0.36	1	0.36
10	151&above	0	0	0.00	1	0.57	0.36	1	0.36
	Total	104	100	37.28	175	100.00	62.72	279	100.00

SECTION IV.6: METHOD OF TREATMENT :

IV.6.1. The main limiting factors for the establishment of seedlings in this area are insufficient sub soil moisture, highly compact soil structure and heavy biotic pressure. Top soil has been washed away in a vast area since there is no significant vegetation as a result of which most of the areas do not have even adequate soil depth and porosity to support the tree crop, therefore intensive soil and moisture conservation measures shall be undertaken in these areas.

IV.6.2. As per the observations the earlier efforts of afforesting these areas have failed to a large extent and appropriate care is expected to afforest these areas in future. Intensive observations in relation to treatment of area and site specific treatment plans required to be prepared keeping in mind about the site conditions, therefore it has been decided to treat these areas in two phases.

A) Phase – I :- Restorative :

The duration of phase I is of minimum one year. Survey and demarcation, soil and moisture conservation works along with complete protection by digging TCM or Barbed Wire fencing shall be undertaken in this phase. Nala bunding works and other appropriate soil and moisture conservation works shall be taken up on watershed basis i.e. Ridge to valley approach, Contour Trenches depending upon the site requirement shall be undertaken and seeds of suitable species like Glyrosidia, Maharukh, Khair and the other local species shall be sown on the mounds of trenches and TCM. Singling and Cut Back Operation shall be carried out in order to improve rooted sock in the area.

B) Phase II :- Productive Phase :

The duration of this phase shall be of 5 years. The Range officers shall inspect the area and prepared the treatment map in the IInd year. Minor repairs of soil and moisture conservation works shall also be undertaken if necessary. PPO/PYO work shall be undertaken in IInd year onwards.

IV.6.3 The Range officers shall prepare the treatment map with the features of crop density, soil type, topography and natural regeneration areas of one ha. at one place and above features shall invariably be shown on the treatment map. The treatment map shall indicate about the treatment proposed to be given grid wise. Selection of species shall be purely based on the requirement of site suitability and to be decided in consultation with the local people. Joint Forest Management approach i.e. motivating and involving local peoples in plantations and active participation of local peoples to be encouraged to raise successful plantations.

IV.6.4. Naturally regenerated seedlings and healthy coppice shall be tended considering it supplement to Artificial Regeneration. Number of plants per ha. including Natural Regeneration and Artificial Regeneration shall be restricted to 1000 seedlings per ha. This is to increase managery inputs (Soil working, mulching, fertilizer application, better nursery stock, etc.) to each seedling rather than more number seedlings other than any inputs. The plantation works shall not be taken up in those areas in which the established regeneration is adequately presents and the results of seed sowing is excellent.

SECTION IV.7: FORMATION OF COUPES AND PLANTATION SERIES :

IV.7.1 There shall be 20 coupes in each working circle and the details are given in APPENDIX NO.XLII(B) of volume II. The coupes shall be laid in such away, so that equal area is made available for each year Afforestation

SECTION IV.8 : REGULATION OF YIELDS :

IV.8.1 Since most of the area is degraded, no appreciable yield will be realized.

SECTION IV.9 : IMLPEMENTING AGENCY :

IV.9.1 All prescribed operations will be implemented departmentally including plantation works.

SECTION IV.10 : METHOD OF EXECUTING THE WORK :

IV.10.1 Demarcation :- The annual felling coupe shall be demarcated one year in advance.

IV.10.2 Preparation of the treatment map :- After the demarcation of the coupe a treatment map will be prepared by the Range Forest Officer and it shall be verified by the Assistant Conservator of Forests emphasizing the suitability of sites for plantation, as well as the promising natural regeneration of areas. The indicator maps for all compartment showing A,B,C & D type areas along with the extent of area have been given in Volume II of the present of plan and the officer while preparing treatment map obtain guidance from the indicator maps The following categories of area shall be shown distinctively in the treatment map.

1. Category “A”:- PROTECTION AREAS: It shall include the following areas.

- i. Area with steep slope i.e. more than 25°
- ii. Eroded areas or areas liable to erosion.
- iii. 20 meters wide strip on either side of the water courses.

2. Category “B” :- UNDER STOCKED AREAS: Includes areas with crop density less than 0.4 and exceeding 5 ha. and above at one place.

3. Category “C” :- POLE CROP AND OLD PLANTATION AREAS: It includes pole crop of established regeneration of teak and other species suitable for retention as future crop in addition to old plantations. The survival of old plantation will be more than 30% and extent of the area should not be less than 1 ha. at one place.

4. Category “D” :- WELL STOCKED AREAS: It includes the areas crop density more than 0.4.

IV.10.3 Treatments :- Various treatments proposed for deferent categories of the areas are as under:

1. Category “A”:- No felling is prescribed. The soil and moisture conservation works shall be carried out as given in the Chapter on Miscellaneous Regulations. Teak and other species shall be planted in the under stocked areas, Where the area exiting 5 ha. and above in extent at one place as per requirements of site. Whereas in the under stocked areas where the extent of areas is less than 5 ha. seed dribbling of suitable species is suggested.

2. Category “B”:- The soil and moisture conservation works shall be carried out in order to increase the productivity of the soil and to check soil erosion. Gap planting with teak and other species and seed dribbling shall be under taken as per the conditions of the site. Felling shall be done as prescribed under the marking rules.

3. Category “C”:- No plantations shall be carried out in this area. Marking for thinning shall be done in the young pole crop as well as in old plantations to create appropriate spacement as per the stand table

4. Category “D”:- No planting will be done in these area. Felling will be done as prescribed in marking rules.

SECTION IV.11: MARKING TECHNIQUES AND MARKING RULES :

IV.11.1 Marking techniques :- Marking techniques for felling of the trees is discussed in the chapter on Miscellaneous Regulations.

IV.11.2 Marking rules :- Marking will be carried out by the Range Forest Officer and under the guidance of Assistant Conservator of Forests concerned. The Deputy Conservator of Forests will himself inspect as may as coupes as possible In order to give proper guidance and instructions to the staff and also to have check against excess marking if any. The marking rules of various categories of areas are as under :

1. Category “A”:- No tree will be marked for felling.

2. Category “B”:-

- i. No tree will marked for felling.

- ii. All live high stumps shall be cut back.
- iii. Multiple coppice shoots and poles will be reduced to one per stool retaining the vigorous one.
- iv. The unwanted under growth which is preventing or likely to prevent the development of seedling regeneration of the desired species will be removed. Therefore all efforts shall attempted to protect and develop the rooted stock.

3. Category “C”:- The congested young poles will be marked for thinning to reduced the congestion by bringing down the number of poles per ha. as per the yield table. The dead, dying, disease and malformed poles will be marked first for thinning. The multiple poles will also be thinned retaining one most promising pole for stool.

Appropriate care shall be taken to retain the poles of seedling origin while removing poles of coppice origin.

Congested crop in the old plantation areas will also be marked for thinning retaining the number of trees per ha. as prescribed in the stand table.

4. Category “D”:-

- i. Marking will be done to reduce the number of stems or poles to one per stool retaining the most promising one in entire multiple coppice teak crop.
- ii. All live high stumps shall be cut back..
- iii. All the dead trees shall be marked for felling retaining 2 per hectare.

SECTION IV.12: SOIL AND MOISTURE CONSERVATION WORKS :

IV.12.1 The soil and moisture conservation works shall be under taken in the restore of phase. i.e. Phase I discussed in Miscellaneous regulations.

SECTION IV.13: REGENERATION :

IV.13.1 The Natural Regeneration of teak and other species, through noticed in same patches at certain place usually die before getting established due to highly compact soil structure coupled with bad drainage and aeration in addition to high incidence of cattle grazing and recurrent fires. To help young recruits of teak and other species to establish develop natural regeneration the following prescription shall be adopted :

- i. Identification of the areas containing promising Natural Regeneration shall be done inside the coupe.
- ii. The undesirable undergrowth which is preventing or likely to prevent the development of Natural Regeneration of the desired species shall be removed.
- iii. Identification of patches of natural growth and shall rigidly protected from the fire and grazing and suitable thinning and tending will be carried out coppice shoots which interfering with the development young natural seedlings shall be removed. A little opening up top of canopy by felling of marked trees and the ground cover at some places shall boost in establishment of natural regeneration of teak and other species by providing better light and aeration.
- iv. The Natural Regeneration should be cleared of weeds within the diameter of one meter and these weeds, grasses, leaf litter, twigs, leaves and branches shall be spread in 15 cm. high layer all around the seedlings within the cleared area to provide organic mulch. Two or three spread full of earth shall be thrown to the mulch in place. Therefore it will keeps the soil around the plants free from weeds as well as help securing the loosening and aeration of the soil by worms and insects. In addition, stone mulching shall be done around the current year recruits in the areas where surface stones are available. Small stones shall be arranged in a circle closed around the very young seedlings which will help in retention of surface moisture as well as avoid accidental trampling by cattle or others.

- v. These areas shall be protected from biotic interference as well as from recurring fires. The natural regeneration shall be supplemented with artificial regeneration in the under stocked areas.

SECTION IV.14 : PREPLANTING AND PLANTING OPERATION IN PHASE II

IV.14.1 PREPLANTING OPERATIONS : The plant population of both NR & AR Growth shall be maintained around 1000 ha. Nursery stock should be tended with care so that the seedling of various species grow in to healthy and hardy planting stock and attain sufficient height when planted out.

The seeds for raising nursery stock shall be from known source specially from plus trees.

IV.14.2 CHOICE OF SPECIES :- The choice of species will be based on climatic and edaphic conditions and also preference of local community. The native species that occur naturally, and of proven fodder grasses, fruit, non wood forest produce and some of the timber species shall be preferred. To suggest some of the species are Teak, Neem, Dhawada, Arjun, Babul, Khair, Nilgiri, Glyricidia , Jamun, Bel, Apta, Anjan, Biba, Bamboo, Behada, Hirda etc. The palatable grass species may be Sheda, Paunya and Marvel shall be preferred. Bamboo can be planted along the nallahs. Better planting stock shall be ensured and the area of plantation is closed either by TCM or barbed fencing. It is advisable that on the mound of TCM a row of suitable fast growing thorny species shall be planted along with Agave bulbils.

IV.14.3 FIRST YEAR OPERATION :

- 1 PLANTING :** Plats shall be completed within a fortnight from the outbreak of monsoons. The teak seedlings or stumps shall be planted after first monsoon showers. Polypot plantation will be taken in case of miscellaneous species.

- 2 WEEDING AND CASUALTY REPLACEMENT :**

- i.** The weeding shall be done in the First Year as for the following scheduled.

Ist weeding : by end of July

IInd weeding : by beginning of September

- IIIrd weeding : by mid of October
- ii. Casualty replacement shall be carried out along with Ist weeding if required. The Natural Regeneration is properly tended as prescribed in Sect. 13.

IV.14.4. SYO AND TYO :

1. In the SYO plantation casualty replacement and two weeding & will be done as per the following scheduled .

Casualty Replacement : by mid July.
Ist weeding : by end of August
IInd weeding : by end of October

2. **MULCHING** : Mulching and hoeing will be carried out along with IInd weeding. In the third year operation only one weeding will be done that month of September followed by thorough soil working in the month of October.

In both these years, the Natural Regeneration shall be identified and tended as per prescribed given Sect. 13.

SECTION IV.15 : SUBSIDIARY SILVICULTURAL OPERATIONS:

IV.15.1 CBO : Cutting Back Operation shall be carried out one year after the main felling in the coupe as per the following prescriptions.

- i. All established multiple coppice shoots and poles will be reduced to one per stool.
- ii. Newly establishing multiple teak coppice shoots shall be suitably tended and reduced to one per stool retaining most promising one.

IV.15.2 CLEANING :

It will be carried out during the 6th year of the main felling as per following rules all inferior species including the unwanted undergrowth interfering or likely to interfere with the growth of coppice as well as the seedling regeneration of teak and other valuable species shall be cut back.

- ii. The most promising coppice shoots out of the retained previously will be retained all other newly teak coppice shoots will be removed.
- iii. Established regeneration of teak and other miscellaneous species shall be suitability spaced. All teak coppice shoots interfering with the growth and development of seedling regeneration of teak and other valuable species will be cut back.

IV.15.3 THINNING : The thinning will be carried out as per the stand table based on age of the crop and site quality.

SECTION IV.16 : OTHER REGULATIONS :

IV.16.1 Main felling coupes and plantation sites shall be fire traced and remain closed for grazing for a period of 5 years from the main operations. The area shall be cleared off all the dry and cut remains of bushes, leaves etc by end of February to avoid fire hazards to the standing crop as well as to the Natural and Artificial Regeneration. Effective protection against fire must be ensured during the fire seasons so that the survival and establishment of the seedlings for development into future growing stock can be achieved.

IV.16.2 Fire protection shall be achieved through Joint Forest Management Committees. A comprehensive fire fighting scheme shall be prepared out, and the details of approach are given in the Miscellaneous regulations.

SECTION IV.17. CLOSURE TO GRAZING AND RAISING OF FODDER:

IV.17.1 The coupe shall remain closed to grazing for a period of 5 years after main felling. At the time of planting the under stocked area in each coupe, the seeds fodder grass like Paunya, Sheda, etc shall be shown to have enough fodder of good quality .

IV.17.2 The villagers shall be motivated to harvest the fodder on rotation basis from such coupes.

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CHAPTER V

WORKING PLAN FOR FODDER IMPROVEMENT WORKING CIRCLE

SECTION V.1:- GENERAL CONSTITUTION :-

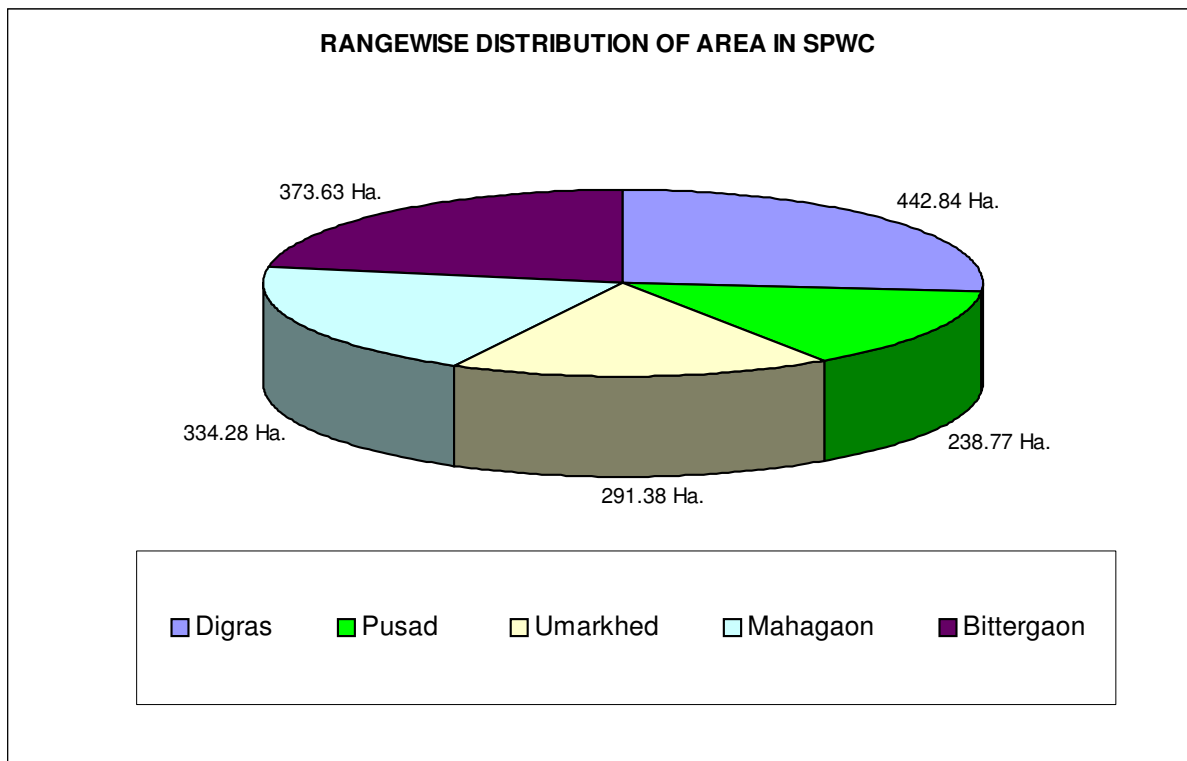
This Working Circle includes **1.** The area managed under Pasture Improvement Working Circle in the past., **2.** The areas managed under Fodder Reserve Working Circle in the previous plan., **3.** The areas treated under CWR, Plantation Working Circle, Misc. Working Circle in the earlier plans. In the ongoing Gupta's working plan the areas managed under Fodder Reserve Working Circle.

The extent of area proposed to be allotted to this working circle is 1680.90 Ha. and these areas are generally located adjoining to villages. If the areas properly managed it will yield good fodder to meet the fodder demand for local cattle population to a large extent.

TABLE NO. -54

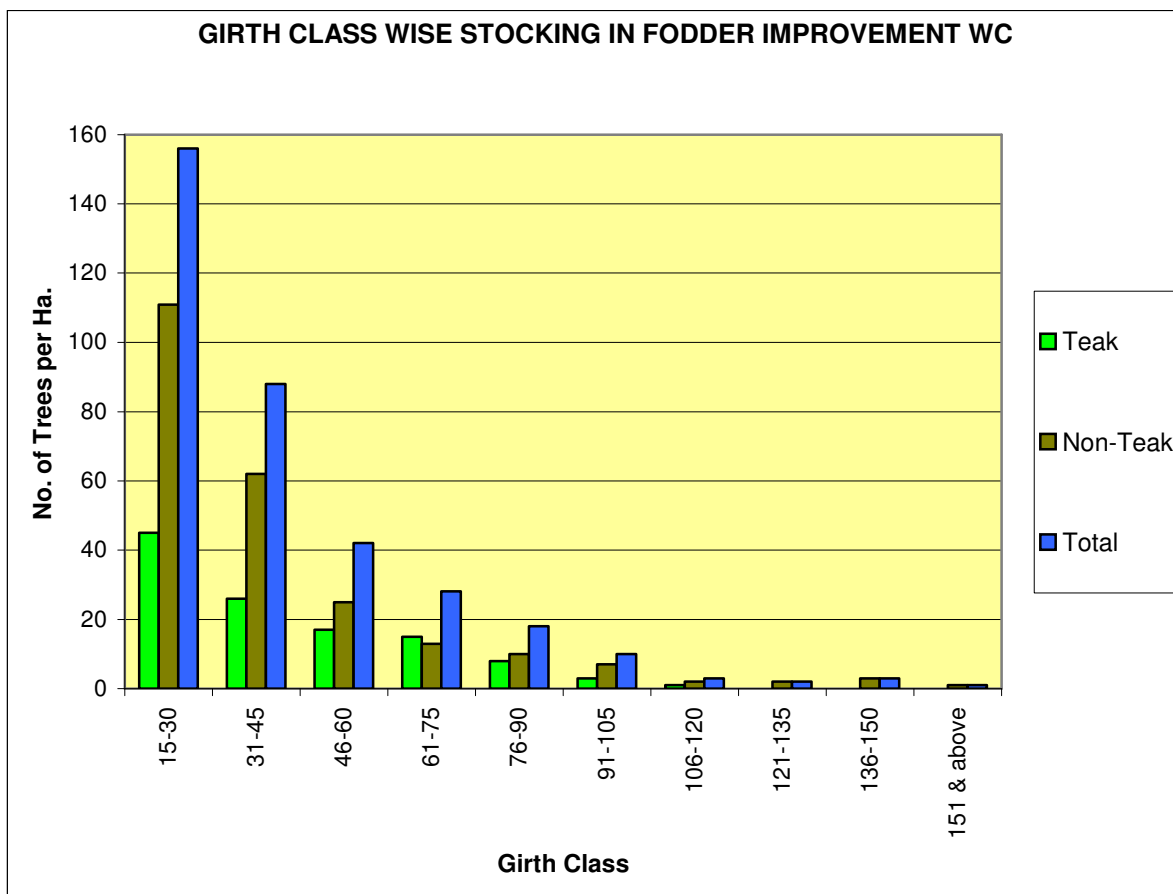
RANGEWISE AND CATEGORYWISE DISTRIBUTION OF AREA IN SILVI PASTURE WORKING CIRCLE

Sr N.	Range	Area of the Range (ha)	Area allotted (ha.)				% to the area of the Range	% to the area of WS
			RF.	PF.	U F	Total area		
1	Digras	16392.93	442.84	---	-	442.84	23.27	22.42
2	Pusad	16828.97	238.77	---	-	238.77	36.35	36.77
3	Shembalpipri	12728.70	---	---	-	---	24.03	17.97
4	Umarkhed	11222.45	291.38	---	-	291.38	34.62	22.84
5	Mahagaon	10293.78	334.28	---	-	334.28	---	---
6	Bittergaon	1968.43	373.63	---	-	373.63	---	---
	Total	69435.26	1680.90	---	-	1680.90	19.71	100.00



SECTION V.2 :- GENERAL CHARACTERISTICS OF VEGETATION :-

The site quality of the area is IV B and the area is mostly devoid of proper tree growth and are sparsely wooded with species like teak, Hiwar, Palas, Bor, Khair, etc. Majority of these areas less fodder value grasses like Kushal grass (*Andropogon contortus*) and Burbshi (*Eragrostis tennela*). Good quality of palatable grasses such as Sheda, Pauniya and Marvel are also present in less quantity. Due to closure of this area the young regeneration of some of tree species is noticed in this areas. The sub type of vegetation is degraded scrub forest.



SECTION V.3:- SPECIAL OBJECTS OF MANAGEMENT :-

1. To improve the quality of fodder and to enhance the quality in the areas by introducing palatable species of grasses and tree species of fodder value.
2. To meet the demands for good palatable fodder of local cattle population and reduce heavy grazing pressure on the forest.
3. To conserve soil and moisture in the area and to improve vegetation cover.

SECTION V.4:- BLOCKS AND COMPARTMENTS :-

There are six compartments included in this working circle. These six compartments are distributed over 5 Ranges. Compartment numbers are Bitergaon Range 495, Digras 356,743, Mahagaon Range 336, Pusad 349 and Umerkhed Range 449.

SECTION V.5:- ANALYSIS AND VALUATION OF CROP :-

The existing stock map have been updated the stock is assessed with the help of satellite imageries with appropriate ground truth verification. Mostly the areas are open and degraded. Analysis of the enumeration data highlights the non-teak percentage is almost doubled in comparison to teak. The matured trees are very less in number whereas in lower girths the crop represents maximum trees of both teak and non-teak. The number of trees per ha. approximately is 280.

Enumeration :-

The enumeration was carried out by SOFR Amravati and the results are given in the table mentioned below.

TABLE NO. -55

ENUMERATION DATA (GIRTH CLASSWISE) IN SILVI PASTURE WORKING CIRCLE

Sr.No	Girth Class	Teak			Others			Total	
		No.	% age wrt Total teak spp.	% age wrt Total stock.	No.	% age wrt Total Misc. spp.	% age wrt Total stock.	No.	% age wrt Total stock
1	15-30	45	39.13	12.82	111	47.03	31.62	156	44.44
2	31-45	26	22.61	7.41	62	26.27	17.66	88	25.07
3	46-60	17	14.78	4.84	25	10.59	7.12	42	11.97
4	61-75	15	13.04	4.27	13	5.51	3.70	28	7.98
5	76-90	8	6.96	2.28	10	4.24	2.85	18	5.13
6	91-105	3	2.61	0.85	7	2.97	1.99	10	2.85
7	106-120	1	0.87	0.28	2	0.85	0.57	3	0.85
8	121-135	0	0	0	2	0.85	0.57	2	0.57
9	136-150	0	0	0	3	1.27	0.85	3	0.85
10	151&above	0	0	0	1	0.42	0.28	1	0.28
	Total	115	100	32.76	236	100	67.24	351	100

SECTION V.6 :- METHOD OF TREATMENT :-

1. As it is degraded area extensive soil and moisture conservation measures work shall be prescribed like Gully Plugging, Nalah Bunding at suitable places and Contour trenches as per the agro climatic models of the Soil Conservation department (1000 to 1200 Rmt/ha) depending upon the site quality is advocated.
2. All obnoxious weeds and thorny shrubs and bushes shall be uprooted and the unpalatable grasses shall be removed by ploughing in the area in pre flowering stage.
3. Broadcasting of seed of superior grass species shall be taken up after ploughing along with contour trenches at the onset of monsoon. The tussocks of palatable grass species of freshly excavated and heaped soil bund on the lower side of trenches.
4. The fodder grasses shall be allowed to be cut only from 3rd year onwards after seedling.
5. Plantation of tree species like Anjan, Babul, Subabul, Kusum, Sirus, Tiwas etc. of fodder value shall be taken up by poly pot planting during the monsoon.
6. The area shall be completely protected from uncontrolled grazing, fire, etc. The area shall be closed with barbed fencing or cattle proof trenches in order to have a complete protection.
7. The area shall be effectively fire traced and protection from fire every year.
8. The cutting of grasses for stall feeding of cattle shall be allowed in these areas for 1st three years after planting. The grazing shall be regulated as per Government policy on rotation basis.

Treatment for Ramnas :-

1. All the ramnas shall be completely fenced with barbed wire or TCM shall be dugged.
2. These ramnas shall be completely closed to grazing.
3. Every year 1/5th area of each ramna shall be treated as a coupe of working series. A treatment map shall be prepared indicating 1/5th area of ramna as coupe of working series. The area selected for treatment shall be kept closed for cutting for the same year.
4. Ramnas shall be sold by auction in the month of June, July. The disposal of grass from the closed coupes will be done as per the instructions contained in G.R. no. MFD-1169/118931(6)-F-2, Dt. 29/10/1976, in which it is treated that the grasses from closed coupes will annually be offered on cutting terms to Grampanchayat or public bodies or FLCS in the neighboring area at a reasonable price to be fixed by the department considering the availability of grass and current market trend. If these public bodies do not come forward to purchase the grass then grasses may be sold in public auction or may be allowed to be removed by the local people at free of cost without damaging the forest.

SECTION V.7 :- CHOICE OF SPECIES :-

Seed broadcasting and tussock planting of good palatable grasses like Sheda (*Sehim Nervosum*), **Paunya** (*Schima Salcutum*), **Marvel** (*Dicantun annulatum*), Ned Gavati (*Panicum Antidotale*), etc. The fodder tree species prescribed are Babul (*Acacia Nelotica*), **Anjan** (*Harwickia Binata*), **Sirus** (*Albizia Lebbek*), **Apta** (*Bauhinia species*), **Tiwas** (*Ougenia Daldergioides*), etc. However the selection of fodder species shall be as per the site requirement.

SECTION V.8 :- FORMATION OF COUPES :-

The entire area shall be constituted into 2 working series and each working series is divided into 10 annual coupes. The details of coupes formed have been given in appendix no.XL(b) of Volume II.

SECTION V.9 :- IMPLEMENTING AGENCY :-

All prescriptions shall be carried out departmentally.

SECTION V.10:- SOIL AND MOISTURE CONSERVATION WORKS :-

The soil and moisture conservation work shall be taken up as the details in the chapter on Misc. regulation.

SECTION V.11:- REGENERATION :-

The areas shall be worked for enhancing the production of fodder. The regeneration of palatable grasses and tree species preferred over unpalatable grasses and trees. The Natural regeneration will be supplement with Artificial regeneration if needed.

SECTION V.12:- OTHER REGULATIONS :-

The main working coupes and Ramnas are effectively fire traced every year and protected these areas from uncontrolled grazing and fires.

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CHAPTER VI

WORKING PLAN FOR NON WOOD FOREST PRODUCE (OVER LAPPING)

WORKING CIRCLE

SECTION VI.1:- GENERAL CONSTITUTION OF THE WORKING CIRCLE

This is an overlapping working circle which covers the entire forest tract of Pusad Forest Division (69435.26 Ha.) except those areas transferred to Paingana Wild Life Sanctuary as well as FDCM.

The non wood forest produce includes both minor forest produce as well as medicinal plants that are situated in this forest area.

TABLE NO. -56

NUMBER OF MINOR FOREST PRODUCE SPECIES AND PERCENTAGE

Sr. No.	Species	Total Trees	Percentage
1	Tendu	268859.86	1.530
2	Kadai	2309.40	0.013
3	Dhawda	325711.04	1.850
4	Charoli	78186.99	0.445
5	Moha	55020.52	0.313
6	Behda	35170.84	0.200
7	Khair	55469.57	0.315
8	Salai	10370.26	0.590
9	Kulu (Kahu)	989.57	0.006
10	Anjan	16187.88	0.092
11	Aonla	1364.13	0.078

SECTION VI.2:- GENERAL CHARACTERISTICS OF VEGETATION :-

The major non wood forest produce species found in this area are Mahua, Char, Tendu, Kulu, Dhawda, Hirda, Behada, Awla, etc. These non wood forest produce species are scattered all over the forest tract well mixed with other species. The site

quality of this tract is generally vary between IV A and IV B with intermittent patches of site quality III. The non wood forest produce is extracted from various parts of the tree depends upon the species and utility.

SECTION VII.3:- NON WOOD FOREST PRODUCE OF THE TRACT :-

Minor Forest Produce - The species of non wood forest produce are available throughout the tract with varying degree. These contributed to a large extent to meet the non wood forest produce demand of local forest dwellers directly or indirectly not only play an important role in economy but also generate employment to the local people. The important non wood forest produce Moha flower, Moha seed, Tendu, Myrobalan (Hirda, Behada, Aoala), Charoli, Kulu, Dhawda, Honey.

Medicinal Plants - A rich variety of medicinal plants are found in the forest tract of the Pusad Forest division which yield a variety of medicines that are used for curing of different ailment by the local peoples. The medicinal plants play an important role in socio-economic culture, spritual and medicinal arena of local villagers/tribes. Their conservation, sustainable management and harvesting can preserve and conserve bio diversity retaining human and environmental health, generate employment and earn foreign exchange by way of exports.

The importance of medicinal plants and its products has been realized throughout the world in the resent past. The World Health Organization advocating use of products of medicinal plants.

These plants not only play an important role in maintenance of balance and conserve biodiversity but also they are looked upon as future source of Medicare of human.

At present the knowledge about use of various products of medicinal plants is meger, still there is lot to explore in this field and acceptability to use medicinal plant is to be enhanced. The distribution of medicinal plants is in the entire tract but the present method of extraction of medicinal plants are not favourable for future conservation of medicinal plants. In this area many peoples do not know the methods of scientific and non destructive harvesting of products from medicinal plants.

Some of the medicinal plants are not identified in this area which requires intensified surveys and studies at micro level for appropriate knowledge in-situ conservation. The present field survey by SOFR is at macro level which does not give true picture about most of the medicinal plants. Many medicinal plants appear during rainy season if the survey is carried out after rainy season many species of medicinal plant may not appear in the survey of SOFR because of their life cycle. Mere identification of species of medicinal plants does not sufficient intensive survey and study needs to be carried out during the season before completion of their life cycle. Moreover most of the field staff do not have appropriate knowledge to identify and study these medicinal plants. The field staff is required to orient themselves towards medicinal plants. Important medicinal plants which have been identified in this area are given in the following table.

TABLE NO. – 57

**TABLE SHOWING THE MEDICINAL PLANTS IDENTIFIED IN
PUSAD FOREST DIVISION AND THEIR USES**

Local Name	Botanical Name	Part use for Medicine	Use Purpose	Other Uses
1	2	3	4	5
Apta	Bauhinia racemosa Lamk	Flowers & Leaves	Eye Treatment , Headachhe,	Leaves are used
			Cough	for B.D.
Bibba	Semacarpus anacardium	Seeds	Cough & Cold Headache	Seeds used as Tonic
			& Body Ace	
Dhawada	Anogeissus latifolia	Seeds, Gum Bark	Decentry & Tonic	Gum used as Tonic
	Wall			
Jambhul	Syzyium cumini	Leaves,Seeds,& Bark	Decentry & Omating	Used in Dibeties
			Urinal Problem	
Moha	Madhuca (latifolia)	Flowers, Seeds,	Urinal Problem, Decentry,	Flowers are used
	Congifolia	Leaves & Bark	Heel Crack	for Tonic
Muradshenga	Helicteres isora	Flowers & Seeds	Stomach Problem &	
			Ear Problem	
Palas	Butea monosperna	Seeds,Flowers & Root	Pregnacy, Urinal	Root Bark is used
		Bark	Problem,Scorpin Bite	as a Rope
Katsawar	Bombax ceiba	Bark,Gum,Flowers &	Gyenic Problem,Tonic	Roots are used
		Roots	Decentry	as Tonic
Umbar	Ficus racemosa	Seeds,Leaves,Laticus	Mouth, Skin problem	
Khair	Acacia catechu	Leaves,Seeds,& Bark	Skin,Mouth Problem	Kattha manufac-
				turing.

Karanj	Pongamia pinnata	Seeds & Leaves	Skin Problem, Wound	Oil is extracted
			Stomach Problem	from seed.
Adulsa	Adhatoda vasica	Fruits & Seeds	Cough & Asthama	Tonic.
Kalmegh	Andrographis paniculata	Whole plant	Rabbies & Snake repellent	
Gokarna	Barleria cristata	Leaves & Roots	Boddy pains	Tooth Powder
			Swelling	
Gajkarni	Rhinacanthus nasuta	Roots & Leaves	Anti Cancer	
Agadha	Achyranthes aspra	Seeds & Oil	Cough, Rabies	Tonning
Cashew nut	Anacardium occidentale	Seeds , Bark & Root	Tonning, Skin,	Tonic
Ghingan	Lannea coromandelica	Bark & Leaves	Wounds, Swelling	
Sitaphal	Annona suamosa	Fruits & Leaves	Killing lice, Wounds	Tonic
Brahmi	Cantella asiatica	Whole Plant	Asthma,Fever &	Tonic
			Leprosy	
Saptaparni	Alstonia scholaris	Bark	Asthma,Malaria &	
			Child birth	
Sadafully	Catharanthus roseus	Whole Plant	Cancer,Diabetes	
Kuda	Holarrhena antidysenterica	Bark & Seeds	Cough, Fever &	
			Dysentery	
Pandhara Chapha	Plumericaumnita	Latex	Scabies & Gum	
Sarpagandha	Rauvolfia serpentina	Roots	Snake bite, Fever	
Kala Kuda	Wrightia tinctoria	Bark & leave	Anti dots, Snake bite	
Vacha	Acorus calamus	Rhizomes	Asthama,Dysentry	
			Anlegesic	
Suran	Amoriphophalus paeoniifolus	Corm	Piles,Throat,Weakness	Tonic
Rui	Calotropis gigantea	Whole Plant	Asthama,Leprosy &	
			Antidot	
Medsing	Gymnema sylvestre	Whole Plant	Diabetes, Leucodma	
Anantmool	Memidesmus hemidesmus	Roots	Skin diseases,Fever	
Akkalkara	Anacyclus pyrethrum	Roots	Tooth decay,	Heart Tonic
			Fever	
Kadujire	Cntratherum anthelminiticum	Whole Plant	Against wormas	
Maka	Eclipta alba	Whole Plant	Skin diseases,	Hair Tonic
			Jaundice	
Gorakhmundi	Sphaerantus indicus	Whole Plant	Cough,& Gastric	Blood purification
Kurmudi	Tridax procumbens	Whole Plant, Flower	Wounds, Skin diseases	
			Scorpion bite	
Samudraphal	Barringtonia acutangula	Bark,Seeds	Liver,Disorders	
Rakta-rohida	Tecomella andulata	Bark	Skin diseases,Injuries	
Kanchan	Bauhinia varniegat	Bark & Flower	Dysentry,Leprosy	
Sagargota	Caesalpinia bonducella	Seeds,Roots	Malaria,Fever	Tonic
Chilahar	Caesalpinia sepiaria	Seeds	Uterine	Tonic

Amaltas	Cassifistula	Seeds, Flower & Roots	Asthma, Cancer	Blood purification
			Antidot	
Waghati	Cappri moonii	Fruits,	Cough,	Tonic
Behada	Terminalia bellirica	Bark, Fruits	Aniemia, Cough, Fever	Tonic
Hirda	Terminalia Chebula	Fruits,	Skin diseases, Fever	Tonic
Amarbel	Cuscuta reflexa	Whole Plant	Burns, Eye diseases	Tonic
Dudhavel	Lettsomia setosa	Leaves	Medicinal uses	
Bhokar	Cordia dichotoma,	Fruits, Barks & seeds	Dyspepsia, Dysentery,	
			Urinary disorders	
Keokand, Kust	Costus speciosus	Rhizomes,	Skin isease, leprosy,	
			Asthma	
Chirati	Mukia maderaspatana	Roots	Tooth decay,	
Musta	Cyperus rotundus	Tubers	Dysentery, Cough	
Dukkerkand	Dioscorea bulbifera	Tubers	Abdomen pains, bone	
			fracture, skin deseases	
			& jaundice	
Jamalgota	Baliospermum montanum	Leaves, Seeds	Asthma, Bronchitis,	
			Purgative,	
Ratanjot	Jatropha curcas	Roots, Latex	Abortifacient agent,	
			Burns, Cancer &	
			Inflammation	
Rohini	Mallotus philippensis	Seeds	Treatment of Blisters	
Aonla	Phyllanthus emblica	Fruits	Asthma, Bronchitis,	Liver Tonic
			Cold, Constipation	
Bhuiawalki	Phyllanthus fraternus	Whole Plants	Allergy, Dysentery	
			Jaundice, Gastro,	
			Urinal disorders	
Tendu	Diospyros melanoxylon	Fruits	Skin deseases,	
			Urinary complains	
			Germicidal	
Gunj	Abrus precatorius	Roots, Plants	Aphrodisiac, blood purifier	tonic, sore throat
			Eczema, Asthma, Cough	
			diarrahoea, pains, menstrual	
			Disorders,	
Palas	Butea monosperma	Seeds, gum, & bark	Treatment of ringworms, &	
			Pimple, ulcers, dysentery,	
			dyspepsia & worm-infestation	
			Flowers to treat Leprosy	
Gokarni	Clitoria ternatea	Roots	Antidot to snake bite	
Salaparni	Desmodium gangeticum	Roots	Chronic fever, vomitting &	
			General debility	
Jyesthmadh	Clycyrrhiza glabra	Roots	Cough, Urinary disorders	
Tiwas	Ougeinia oojeinensis	Bark	Diarrahoea & dysentery	
Karanj	Pongamia pinnata	Seed	Bronchitis, cough, cold,	
			ear complains, joint pains,	
			itching, eczema & rheumatism	

Bibla	Pterocarpus marsupium	Wood	Body pain, diarrhoea	
Raktchandan	Pterocarpus marsupium	Wood	dysentery, skin diseases	
Bajradanti	Tephrosia purpurea	Plant	Asthma, Snake bite	
Bhira	Chloroxylon swietenia	Roots,Leaves, & Bark	Aphrodisiac, & neck pains	
Kali musali	Curculigo orchoides	Roots	Asthma, blindness, cough,	
			cold, epilepsy & Jaundices	
Patharchur	Coleus aromaticus	Whole plant	Urinary problems, asthma &	
			Ulcers	
Dimpal	Leonotis nepetaefolia	Flowers	Ringworm & swellings on	
			Breast & body	
Droon Duru, Patota	Leucas plukenetii	Leaves	Headache,nose bleeding	
			scabies,skin disease	
			Stomachache, constipation	
			& fever	
Van tulsi	Ocimum basilicum	Entire plant	Cholera, snake bites &	
			Detoxication of alcohol	
Satavari	Asparagus racemosus	Tubers roots	nervous disorders,tumors,	
			Dysentery,leprosy, Leucorrhoea	
			fatigue, cardiac debility,	
			cough & bronchitis.	
Safed musali	Chlorophytum tuberosum	Tuberous roots	Sex tonic for men & women	Tonic & treat
				leucorrhoea
Ran-kanda	Drimys indica	Bulb	Cardic stimulator	
			fevers & skin diseases	
Karihari	Gloriosa superba	Seeds	Treat the gout.	
Madang	Dendrophthoe falcata	Plant	Antifertility, skin diseases	
Sonchaffa	Michelia champaca	Plant	Inflammation,Antifertility,	
			Asthma,bronchitis, fever,	
			Menstrual complains	
Antibala	Abutilon indicum	Seeds,leaves & roots	Demulcent, bronchitis	
			leprosy, piles & ulcers	
Jasvant	Hibiscus rosa	Bark	Skin diseases	
Bala	Sida cordifolia	Whole plant	Dysentery, gonorrhoea	
Jangli-methi	Sida rhombifolia	Roots	Child birth, tonic & against	
			Dysentery, gonorrhoea	
			heart ailments.	
Neem	Azadirachta indica	Leaves & seeds	Antiseptic, Antipyretic,	Leaves smoke is also
			Jaundice, skin diseases	used Insect repellent
Bakain	Melia azedarach	Leaves & flowers	Against skin diseases	
Vasan vel	Cocculus hirsutus	Leaves & roots	Dysentery, cuts, eczema,	
			Fevers	
Gulvel	Tinospora cordifolia	Whole plant	Asthma, bone fracture,	Health tonics
			diarrhoea,fevers, dysentery,	
			jaundice, malaria & skin dis.	

Khari	Acacia catchu	Heartwood & bark	diarrhoea, eruption of skin,	
			Diabetes & anaemia	
Shikakai	Acacia concinna	Leaves & pods	Hairs & Lever tonic &	
			against skin diseases	
Ratan Gunj	Adenanthera pavonina	Seeds	Wounds & swellings	
Lajkuli	Mimosa pudica	Roots & Leaves	Antifertility, boils, sores,	
			child-birth, epilepsy,	
			gum trouble	
Phanas	Artocarpus heterophyllus	Leaf, root & fruit	Latex is used against	
			skin diseases	
Shevga	Moringa oleifera	Bark, Fruits & roots	Snake bite	Oil is use perfume
				industry.
Vidanga	Embelia ribes	Roots, Fruits & leaves	Cough, diarrhoea, fevers	
			skin diseases	
Widang	Embelia tsjeriam	Bark & roots	Throat complains, tonsils,	
			Treating burns, fever	
			& pneumonia	
Parijat	Nyctanthes arbor	Leaves & flowers	Bone fracture, rheumatism,	
			Malaria, sciatica, ulcers.	
Nagvel, Pan	Piper betel	Roots & Leaves	Antiseptic, Asthma &	
			eye disorders.	
Kalamire	Piper nigrum	Fruits	Treat arthritis, asthma,	
			Cough fever	
Kevada	Pandanus odoratissimus	Roots, Leaves & fruits	Miscarriage, scabies, leprosy,	
			Snake bite	
Lemon grass	Cymbopogon citratus	Leaves	Lemon grass oil, against	
			fever, headache, vomiting,	
			Dysentery	
Vala - Khus	Vetiveria zizanioides	Roots	Treating burns, sensation,	
			ulcers, skin diseases	
Ranjai	Clematis triloba	Whole plant	Treatment of boils, itching	
			& skin disorders	
Maniphul	Catunargegam nutans	Roots & Fruits	Cramps	
Bartondi (podophul)	Morinda pubescens	Fruit, root & leaves	Small pox, urinary complains	
Bel	Aegle marmelos	Fruits, Leaves & roots	Laxative & heart & brain	
			Tonic	
Kavath	Feronia elephantum	Roots & Fruits	Asthma, bronchitis	
			Relieving body pains	
Safed chandan	Santalum album	Bark	Malaria,	
Ritha	Sapindus trifoliatus	Bark & roots	Bodyache, headache	
Moha	Madhuca longifolia	Bark, flowers, seeds &	Sprains, digestive, disorders,	
		Heartwood	Seeds oil laxative & good for	
			Rheumatism	
Khirmi	Manilkara hexandra	Bark & fruits	Body ache, stomachache	
			& chest pains	

Bakul	Mimusops elengi	Bark, flowers & fruits	Plant parts are used	
			Small pox.	
Maharukh	Ailanthus excelsa	Bark	Tonic & treatment of cough	
			Skin diseases	
Datura	Datura metel	Leaves & fruits	Narcotice & antispasmodic	
			Tooth decay	
Mothi-ringani	Solanum ferox	Roots	Against Ashthma,	
		Fruits	blood purification ,	
		Leaves	Stomach disorders	
Kangni	Solanum nigrum	Leaves	Antidot to opium toxications	
			skin infections	
		Fruits	Swellings	
Bhuriningani	Solanum surattense	Roots, Flowers	Bronchitis, chest pains	
		& Fruits	cold, paralysis & snake bite	
Asvagandha	Withania somnifera	Roots	Leucoderma	
Kadai	Sterculia urens	Gum, roots, barks	Tonic bone dislocation &	
		& flowers	Fractures, dysentery	
Surankanda	Tacca leontopetaloides	Tubers	Bodyache, headache	
Dhaman	Grewia tiliifolia	Bark	Dysentey & itching	
		Roots	Syphilis & blood purification	
Arni	Clerodendrum multiflorum	Plant	Bodyache, cholera & fever	
Shivan	Gmelina arborea	Bark & Leaves	Bone fracture, cough,	
			Bronchitis	
Arni	Premna serratifolia	Roots	Cardic disorders, cough &	
			asthma, bronchitis	
Nirgudi	Vitex negundo	Leaves	Body ache, headache	
Hadjod	Cissus quadrangularis	Roots	Bone fracture	
Ran halad	Curcuma zedoaria	Roots stocks palmately	Spike	
		branched		

SECTION VI. 4 :- SPECIAL OBJECTS OF MANAGEMENT :-

The National Forest Policy 1988 clearly pronounced that the development of Non Wood Forest Produce has been one of the objectives in forest management. In consistent with National Forest Policy the special objects of management of non wood forest produce are given below.

1. To protect and manage non wood forest produce and the medicinal plants to utilize the existing potential optimally and to enhance the productivity of the species.

2. To take up appropriate measures for conservation and sustainable use of the species identified as non wood forest produce.
3. To generate employment through non wood forest produce there by improving socio-economic condition.
4. To provide better and improved quality of life of tribal through traditions which support link their life styles into sustainable harvest and use of non wood forest produce.
5. To provide technical know how for scientific and non destructive extraction of medicinal plants.
6. To identify and conserve forest areas of non wood forest produce and medicinal plants.

SECTION VI.5:- METHOD OF TREATMENT :-

Different type of treatment is prescribed for various kinds of Non wood forest Produce therefore the treatment suggested for Non wood forest produce species is as follows.

1. MAHUA :-

- a) **Mahua flower** is rich source of food for forest dwellers which contain Sugar, Vitamin and Calcium. In some of the areas local people also prepared Mahua Spirit out of Mahua flower.
- b) **Mahua Fruit** is cream in colour and edible which are eaten either raw or cooked. The seeds of mahua is rich in oil content. Oil is extracted by local people for their domestic consumption as well as for sale. The Mahua cake which is a product of mahua seed after extraction of oil has got highly nutritive value and it is being exported to foreign countries as cattle feed specially to European countries.
- c) **Yield :-** Mahua trees start bearing flowers between 10 to 15 years of their plantation. Studies have been conducted by MVSS, Chandrapur regarding the yield of Mahua flowers and fruits. The studies of MVSS reveals that average

Mahua trees will yield. Mahua flowers is 1235 Kg in weight and 272 Kg. of seed (in average).

Mahua flowers and seeds are generally collected by local peoples and mostly consumed by them and the surplus will be sold in the market.

As the number of trees is meagre in this forest land the systematic management and extraction of Mahua flowers and seeds is not in practice in this division.

2. GUM :- a) Dhawda Gum (Anogiessus Latifolia) is the main source of gum in this area. This gum is mainly used for Medicine, Chemical, Cosmetic and Food Industries.

b) Yield :- Yearwise production of Dhawada gum is given in Apendix no. XX of volume II. For the purpose of collection of Dhawda gum the entire division is divided into eight gum units which are sold by auction. In this area the tapping of gum is through traditional methods as scientific tapping or non destructive method of tapping is not in practice.

3. Tapping rules :-

The tapping rules of gum derived by the FRI Dehradun are as follows :-

1. The tapping season will commence from November to end of May each year. No tree below 90 cm in girth will be tapped.
2. Tapping will be confined to the main bole of trees between 15 cm from ground level to the point from which first branch is given off.
3. Only trees above 90 cm in girth at breast height will be tapped.
4. Each tree will be tapped continuously for 3 years and will be given a rest for 3 years thereafter. The second tapping cycle will begin in the 7th year after the commencement of tapping season and will continue for another period of 3 years.

5. The initial blaze of 20 cm wide and 30 cm in length or height may be made in the month of November on trees at 15 cm above ground level with a sharp edge having 75cm wide blade the blaze is made 06 cm deep in the dark. Blaze may be made horizontally living approximately equal space between two blazes the blazes should not have any loose Fibre. The lower surface of the blaze should slightly slopping towards to avoiding of guggul in the blaze pocket in case initial blazing is done by adze.
6. The guggul starts oozing out soon after blaze are made and may be collected initially after a month, i.e. about December when the blaze may also be freshened. Subsequent collection and freshening may be done frothnightly up to May. Thus 12 freshening may be required to be made during the year.
7. In each freshening the lower surface is not to be freshened. The age may be scraped so that only 38 cm increase is on either side in width at the end of 12 freshening. This means that about 03 cm should scrap off either side in width in each freshening.
8. The lowest row of blaze will be at 1 mtr. above the ground level. The next row of blaze will be made at the height of 60 cm from the lower i.e. at a total height of 1.6 mtr. from the ground level, the vertical portion of the blaze of upper row will alternate with similar portion of the row and no 2 blazes of the two rows will be directly one above the other.
9. The number of blazes to be made on each tree will depend on its girth at breast height as given in the following table.

TABLE NO. -58

TABLE SHOWING THE NO. OF BLAZES ON TREE FOR GUM

Sr.No.	Girth at breast height	Maximum no. of blazes to be made on each tree.
1	0.9 mtr. to 1.3 mtr.	2
2	1.3 mtr to 2 mtr	3
3	2 mtr. to 3 mtr.	4
4	Over 3 mtr.	1 blaze for every 45 cm girth in addition to category 3 above.

10. No fresh blaze will be made on the partially healed up surface or old wounds. Each blaze will be in a shape of parabola with a 2.5 cm side base. The curved side of parabola will be up wards and of height not more than 7.5 cm and depth of the blaze will not be exceed 0.6 cm in the wood.

11. At the end of the season, the height of the blaze shall not be grater than 12.5 cm. Maximum permissible dimension of each blaze shall be 10X 12.5X 0.6 cm in width, height and depth respectively.

Since the tapping is to be done continuously for 3 years the total height of blaze at end of 3 years of tapping will be 37.5 cm the width and depth remaining the same. In the second cycle i.e. in the 7th year (after 3 years rest) new blazes will be made in the same way in the unglazed portion, in between the blazed portion of the first cycle. This blazing will continue for another 3 years in the manner described above and operation will be repeated till unblazed is fully covered.

Formation of units :- 8 units formed for tapping of gum in entire division. One unit may constitutes one or two rounds.

Agency :- All units are sold in open auction.

SECTION VI.6 :- OTHER REGULATIONS :-

1. It is prescribed compartment wise list of Dhawada trees should be prepared and maintained Beat, Round, Range and Division level.
2. Proper cleaning around the tree to facilitate gum collection and to avoid fire hazards.
3. The gum yielding trees should be reserved form felling.
4. The tapping rules shall be strictly implemented.

3. TENDU LEAVES :-

- a) **Use :-** Tendu leaves is one of the most important non wood forest produces which gives handsome revenue to exchequer and provide gainful employment to the forest local people. Tendu leaves are used for manufacturing 'Bidis' which has got tremendous potential to generate employment directly or indirectly.
- b) **Yield :-** Yearwise production of revenue obtained for the last 10 years are furnished in table given in appendix no. XVII. In order to increase the production of Tendu pruning and pollarding of tendu trees are carried out every year to get good flush of tendu leaves. No other scientific efforts are made to improve the production of tendu. Sometimes local people put fire to forest to get good flush of tendu leaves in connivance with tendu contractors which causes adverse impact on regeneration while carrying out pruning all small size plants of both seed and copice origin plants are cut every year resulted into threat to future seed bearers. If the pruning trees carried out repeatedly the seed bearers will be diminished year after year which will lead to vanishing of the species in this tract.
- c) **Formation of units :-** The entire division is divided into 18 tendu units and which are constituted for the purpose of regulation of trade of tendu leaves under its Forest Produce (Regulation of Trade) Act 1969 vide its no./MFP 2182/240911/F-1, dt. 19th November 1983 of Government of Maharashtra. The tendu units formed in this division are given below.

TABLE NO. -59

TENDU UNIT

Tendu Unit	Range	Name of Tendu Unit
3	Bitergaon	Bitergaon
4	Mahagaon	Chikhali
5	Mahagaon	Mahagaon South
6	Mahagaon	Mahagaon North
7	Mahagaon	Kali Daulat
8	Umarkhed	Krushnapur
9	Umarkhed	Umarkhed
10	Umarkhed	Mudana
11	Shembalpimpri	Shilona
12	Shembalpimpri	Shembalpimpri
13	Shembalpimpri	Fulwadi West
14	Shembalpimpri	Fulwadi East
15	Pusad	Pusad
16	Pusad	Chondhi
17	Pusad	Khandala
18	Pusad	Marwadi
19	Digras	Dehani
20	Digras	Digras

- d) **Agency for tendu leaves collection :-** With the effect of Maharashtra Forest Produce (Regulation of Trade) Act 1969 the trade of tendu leaves has been nationalized under this act. As per the procedure the tendu units are auctioned through tender to pluck, process and dispose of tendu leaves. The system adopted is standard bags system in which production of standard bag is fixed as per the production capacity of the unit. The successful tenderer (Licensee) is allowed to pluck the leaves to the extent of target fixed for the unit.

- e) **Other regulations :-** To improve tendu stocking in the forest, soil around tendu trees should be dug up 15 to 20 Cms. depth in a circular ring of diameter to the extent of crown so as to promote the root suckers. The trees above 45 Cms. girth shall be selected for such operations. Yearly pruning and lopping will adversely effect the future crop therefore pruning and lopping is suggested once in the three years and such an interval will allow some seedlings to establish.

4. MEDICINAL PLANTS :-

There is no separate survey conducted by SOFR, Amravati to assess the quantitative distribution of medicinal plants in this tract. It is suggested that a separate survey should be conducted with the help of experts on medicinal plants to assess the distribution of medicinal plants in this area. It is observed during the field visits that some of the local Vaid (local Ayurvedic doctor) practice Ayurvedic medicine extracted from medicinal plants in these areas for curing of various ailments.

Management of Area :-

Medicinal plants are mostly herbaceous, tubers, shrubs and some trees. The management of medicinal plants is the same as that of non wood forest produce. In the new concept of forest management, the medicinal plant management has been given lot of importance. As on today the extraction of various products out of different parts of medicinal plants is under practice on traditional methods, scientific and not destructive methods of extractions have not been reached to the ground which needs to be addressed on scientific lines. Detailed studies need to be conducted about the occurrence, area, extent, penology and production.

Method of treatment :-

In Pusad Forest division no systematic method of treatment for the management of Medicinal plants has been adopted so far. There is lot of potential of Medicinal plants in this division and approximately 127 species have been identified and their extracts used as medicine in different parts of division by local Vaidhs (Local Ayurvedic Doctor).

In the previous management plan separate treatment for managing medicinal plants was not suggested. In order to have intensive management of medicinal plants, it is necessary to study intensively about their occurrence, area, phenology and judicious utilization of their products. It is prescribed to involve the Joint Forest Management committees in the management of Medicinal plants and to augment their income source. The division should organize training to the members of JFM committees regarding identification, treatment, and management of the medicinal plants and their products along with marketing. Basically the identification of these species through the experts of local universities and colleges. Creation of market links and the bank guarantees for sale of forest produce will create confidence for medicinal plants management. The methodologies shall be adopted as given below.

1. Identification of suitable patches of medicinal plants in which the collection of medicinal plants is already under way.
2. Organisation of local community through competent NGO.
3. Establishing a system of sustainable harvest based on collection guidelines for specific species that are informed by “conservation science”.
4. Specific forest areas shall be assigned to Joint Forest Management committees with the clear delegation of responsibilities and complete accountability. The usufructs shall be shared between the department and members of Joint Forest Management committee on the basis of JFM frame work.
5. Establishment of market links for sale of produce well recognized values of medicinal plants and their parts shall be concentrated.
6. Removal of plants or parts of plants other than specified species shall totally be prohibited. Lopping of branches to collect fruits, leaves and buds shall be totally prohibited. The fruits or seeds that have fallen on the grounds shall be collected and branches can be gently shaken to facilitate the shedding of fruits and seeds.
7. The rich medicinal plants or species about 1 to 2 % of population shall be left as a seed barer to encourage the natural regeneration and seed collection. These shall be properly marked for identification.

8. Species that may be used for primary health care shall be listed out category wise well in advance to facilitate nursery operations. Those species for which the nursery operations are established shall only be taken the nursery to raised the nursery stock.
9. Proportion of medicinal plants shall be increased in the reforestation programmes based on the proportion of medicinal plants after conducting survey.
10. Tending of rooted stock or coppice shoots of existing shall be taken up and natural regeneration shall be encouraged.
11. In the barren patches the seeds shall be shown or seedlings shall be planted and maintained by caring out weeding and soil working.
12. The medicinal plant species like climbers shall be planted close to the natural host, trees or shrubs.

Sustainable harvesting of Medicinal plants :-

The norms regarding sustainable harvest shall be worked out by territorial Dy. Conservator of Forests taking into consideration the results of vegetation survey and availability of Medicinal plant species and the parts of plants or trees used for medicinal purpose.

Harvesting the parts of medicinal plant species shall not be permitted in a way which well affect natural regeneration. In case were the roots tubures, rizomes and other specific parts are used in medicine. The natural regeneration of these species shall be ensured by leaving well distributed and the adequate number of seed bearers. Destructive collection of plant parts, seed and fruits should strictly be prohibited and also uprooting of old tree or plant should be avoided.

In general it is prescribed that while harvesting parts or seeds, fruits and leaves care should be taken for further natural regeneration.

General Rules to be followed :-

1. The estimation of annual collection of non wood forest produce shall be based on experiences i.e. averaging of previous annual collection. The annual estimates of non wood forest produce collection shall be approved by Chief Conservator of Forests of concern circle.
2. The Range Forest Officers shall issue passes for collection of non wood forest produce to the Joint Forest Management committees are lessees and keep record of the collection.
3. The measures shall be taken to improve non wood forest produce by way of protecting the species and by introducing approximate percentage in the population.

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CHAPTER VII

WORKING PLAN FOR JOINT FOREST MANAGEMENT(OVERLAPPING) WORKING CIRCLE

SECTION VII.1:-GENERAL CONSTITUTION OF THE WORKING CIRCLE-

The National Forest Policy 1988 emphasises protecting of traditional rights of forest dwellers and their role in protecting forest resources. As suggested in policy priority shall be given to local people to meet the demands for fuel wood, small timber, fodder and minor forest produce.

The National Forest Policy envisages, creating massive peoples movement, specially involvement of women in protection and management of the forest and minimising excessive pressure on existing forests. The policy also clearly mention that forests should not be considered as a source of revenue but as a national assets which is to be protected and enhanced for the well bearing of the nation and the future generations.

The Govt. of India issued directions to all the state Governments vide letter No.621/89-PP dated 1st June, 1990 a framework for creating massive peoples movement through involvement of village communities in the protection and management of degraded forest lands. The Ministry of Forests and Environment of Govt. of India issued circulars No. 22-8/98-FPD dated February 11, 2000 and No. 22-8/2000-JFM (FPD), dated February 21, 2000 in which detail guidelines are incorporated for the Joint Forest Management Programmes to be taken up by the States.

The Forestry Project of F.A.O. (Food and Agriculture Organization) clearly emphasized participation of rural people has been defined as “as set of inter connected actions and works executed primarily by local community residents to improve their own welfare those may be outside in puts i.e. extension, training, guidance, technical help, financing etc. but its basic focus is on community involvement in doing something for itself.”

The Govt. of Maharashtra also issued guidelines vide Government Resolution No. SLF-1091/ PK119/F-11 dated March 16, 1992 directing to the Forest Department to constitute “JFM Committees realizing the fact that forest protection can not be achieved without active participation and cooperation of local people. Their co-operation is essential in management, protection and regeneration activities of the forest. As per the guideline of GR of 16th March, 1992 instructions issued for preparation of management plans for implementation of Joint Forest Management.

The GR of 16th March, 1992 clearly indicated that preparation of Management Plan for degraded areas in the state involving local inhabitants from adjoining to Forests and seeking their participation through JFM.

The reference of Govt. of India dated 22-8/2000- JFM(FPD) dated February 21, 2000 instructed all the State Government to extend JFM programs to good forest areas also and State Government must seek the participation of women and the member should be 50% of total members of JFM committee and 33% of executive committee members. According circular the JFM activities in good areas is to confine to NWFP activities only, and under no circumstances, the silvi-cultural prescriptions should be altered. The sharing mechanism should be different from the usual and sharing of profit from timber will be only when the committee protect the areas, at least 10 years and sharing percentage not to exceed 20% of the final harvest. The JFM activities extend to good forest areas shall not exceed 100 ha and within 2 km radius. The extension of JFM in good area shall be on a pilot basis and should be done only after the degraded areas have exhausted.

The Pusad Forest Division is having 270 compartments with 262 villages, which reflects that each compartment is having one village. The quality of forest is degraded near by habitations and protection of these areas cannot be achieved unless there is people participation and cooperation. In the light of these facts it is felt that a separate Working Circle need to be constituted and accordingly JFM Overlapping Working Circle is constituted.

The entire forest area of Pusad Division is covered under the JFM Overlapping Working Circle for implementation of JFM. The villagers with homogenous population and forest areas having sizable population of SC and ST and other economically dependent people shall be given.

SECTION VII.2:-GENERAL CHARACTERISTICS OF THE VEGETATION

As the number of villages are more in this Division, naturally, heavy biotic pressure in this Division resulted in degradation of forests specially adjoining to habitations. Those forests required to be regenerated through intensive protection and development of rooted stock and Natural Regeneration. If necessary the natural regeneration will be supplemented with Artificial Regeneration with the active involvement and cooperation of the members of JFM committees. Such areas generally degraded with density less than 0.4, open forest with eroded soils and non-conducive Natural Regeneration.

SECTION VII.3:- SPECIAL OBJECTS OF MANAGEMENT

The special objects of management are in consonance with National Forest Policy 1988 and the governing factors are increasing biotic pressure, depletion of soil, soil erosion due to demand for timber and fuel wood, heavy grazing pressure, repeated forest fires, diversion of forest land for agriculture, industries, housing and irrigation projects etc. To check further loss of forest cover and forest area and to regenerate the degraded forest areas the objects of management have been enunciated which are given below;

- 1 Protection and management of forests by developing a sense of ownership and belongingness about the forests among the local people and to regenerate the degraded forest areas with the active participation and cooperation of the local people.
- 2 To increase the vegetation cover and to carry out soil and moisture conservation works with the active co-operation of local people.
- 3 To involve local people in forest protection and to provide both tangible and intangible benefits in lieu of their cooperation in forest protection.

SECTION VII. 4:- SOCIO-ECONOMIC CONDITION OF THE PEOPLE

The population dynamics as per the Socio Economic Survey published by Economic and Statistical Directorate for Yavatmal District and pertaining to the Pusad Division is as follows;

TABLE NO. -60

TABLE SHOWING POPULATION (CATEGORYWISE) SEX RATIO AND LITERACY RATE

Taluka	Total Population	SC	ST	Others	Sex Ratio	Literacy Rate%
Digras	134928	11387	17846	105695	932	66.6
Pusad	285458	28726	40003	216729	936	71.8
Umarkhed	222818	31301	29992	161525	943	69.8
Mahagaon	158230	15282	22520	120428	935	67.0
Total	801434	86696	110361	604377	936.5	68.8

In Pusad forest division the total human population is 8,01,434 as per sensos report of 2001. The population density is 180 Sq, Km. The sex ratio is about 936/1000. Approximately 85% population live in rural areas. The cattle population in this division is estimated around 43,306 in 2003.

TABLE NO. – 61

CATTLE POPULATION, CATTLE UNITS AND GRAZING FEE COLLECTED

Name of Cattle	Year									
	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
1	2	3	4	5	6	7	8	9	10	11
Buff.	2826	3405	3085	3452	3407	3379	2933	2987	2676	2390
Buff. Calf	727	783	653	703	629	603	588	511	445	533
Cow	30285	14899	27097	35761	34950	34396	32971	17997	21847	25211
Cow. Calf	13079	14044	11155	10954	11923	11392	11669	10185	9453	9052
Ox	8320	28504	11857	6743	3137	3731	345	62801	64826	58242
Sheep	4677	4113	3983	3137	4890	3477	2527	3246	3447	--
Goat.	4310	2719	2996	3731	4096	2613	3353	2296	1841	--
Horse	295	314	279	345	316	263	237	229	202	--
Total Cattle unit.	60805.5	65164	58612.5	62801	62704.5	60394	56772.5	51475.5	49151.5	41170
Total animal	64519	68781	61105	64826	65259	62711	59674	53581	51202	43306
Grazing fee collected	53814	59202	52967	58242	55319	54494	5226	46771	45896	42028

Some of the areas of Pusad Forest Division are remote specially the area adjoining to Painganga Wild Life Sanctuary. The population mostly based on agriculture and allied activities for the livelihood and most of the SC, ST population will work as land less, agriculture labourers. The population adjoining to forest areas mostly depend upon forest for day to day needs naturally cause pressure on forests. The cattle population also cause pressure on adjoining forests for grazing, though there is a separate fodder development working circle. The local people hardly utilize these areas for stall feeding of the their cattle. Heavy grazing pressure over adjoining areas of habitats resulted in degradation of the forest. In some pockets sheep and goats grazing also noticed and they cause extensive damage for the regeneration. Apart from local cattle pressure the migratory cattle also add pressure to forest in this Division. This situation creates the kind of imbalance between the production and utilization levels. It is therefore, to meet the requirements of forest produces to the local people participatory approach is sought for.

SECTION VII . 5 :- COMPARTMENTS AND FELLING SERIES

It is being overlapping working circle, covers entire Pusad Forest Division area most important factor for the implementation JFM is willingness of the local people to participate in these activities in this regard the guidelines of Govt. of Maharashtra GR No. SLP/ 1091/C.N. 119/F-11 dated 16th March, 1992 shall be followed. At present there are 30 committees constituted in the division and total number of compartment allotted to these committees is 45 having an area of 15858 Ha. out of this area 1500 Ha. area allotted for taking up plantation. No felling series are formed and No Compartments are allotted to the felling series as the willingness of the local people is the most important.

Micro plans shall be prepared for the area allotted to a particular village JFM Committee shall be in consonance with the prescriptions of given for the area under the plan. Any deviation shall be required sanctioned from the competent authority.

SECTION VII .6 :- PRINCIPLES AND ETHICS.

Certain principles and ethics should be follows as per guidelines during the implementation of JFM in any village.

- 1 Eco system conservation and sustainable use of resources is the goal of resource management.
- 2 To enable development of strong institutional system in the long run for JFM implementation it necessary to have participatory and democratic structure.
- 3 Open communication system and gender equity are of the prime concern.
- 4 Management responsibility and benefit sharing in relation to traditional usage should be ensured.
- 5 The community shall take the responsibility to maintain the system.
- 6 Effective conflict resolution should be ensured.
- 7 Traditional rights and uses shall be respected and rational approach should be adopted in accepting or rejecting same.
- 8 Discrete jurisdiction and proper terms of agreements should be ensured.
- 9 Effective monitoring and appraisal systems should be adopted.

SECTION VII.7 :- METHOD OF TREATMENT

In the system of JFM the forest staff must know the principle and approach of JFM. The first and foremost thing is to address and convince the local people about the importance of forestry and their role in meeting daily needs of them. The villagers those who are willing to take part in JFM committee and memorandum of understanding shall be signed. The Deputy Conservator of Forests of Pusad Division shall prepare a Micro plan for the areas to be assigned to concerned JFM Committee as provided in the GR dated 16th March, 1992 and guidelines issued by Govt. of India from time to time.

- The Micro plan prepared for the particular village shall be in consonance with the prescriptions contained in Working Plan.
- The Micro Plan shall be sanctioned by a committee constituted by the Government as per GR of dated 16th March, 1992.
- The assigning of the area to committee and execution of works shall be strictly in accordance with the guidelines issued by Government of India as well as Government of Maharashtra.
- The Micro Plan and the Joint Forest Management Scheme shall be implemented through Forest Department or any other agency sanctioned or approved by competent authority.
- MOU shall be signed to extend of areas assigned to JFM Committee and there should not be any ambiguity in terms and conditions of the guidelines.
- The area allotted to particular forest committee should be strictly shown on the map and incorporated in the memorandum of understanding.
- The Micro Plan is scientific document should be prepared with active involvement of members of JFM Committee on scientific lines and the site specific estimates shall be prepared for the works which would be taken up and sanctioned by competent authority before implementation.

SECTION VII.8 :- ACTIVITIES TO BE TAKEN

Forest Protection Committee should be involved to take up the under mentioned activities in the areas assigned to them.

- 1 Stringent protection of forests allotted to JFM committee.
- 2 Active participation of member of JFM committee in protecting, improving and developing Natural Regeneration of the forests.
- 3 Protection of forest from fire, grazing and encroachment upon forest land, collection of NWFP on scientific lines or non – destructive collection methods.
- 4 Helping the forest officials in patrols and enforcement of law for forest protection.
- 5 Timely organizing of the meeting and helping the Govt. official in this regard.

For protection of forest from grazing integrated efforts should be taken to improve the breed of cattle so that, the income may be increased with less of cattle, In this regard the rural development and other departments should be requested to help the member of JFM committee. The forest official will have play the role of facilitator for implementation of various development works. The fire protection should be achieved through JFM Committee by assigning certain fire lines and forest area to the JFM Committee.

The grant for protection of forest from fires i.e. burning of the fire lines, hedges for fire works shall be directly remitted to JFM Committee after successful protection of the forest from the fire. Necessary legal and moral help should be provided to members of JFM Committee for the protecting the forests from illicit felling, encroachment, grazing, fire protecting etc.

SECTION VII .9 :- ROLE OF FOREST OFFICIALS

The role of forest officials in implementing of JFM is as the facilitator.

- 1 Providing technical input and support for the activities prepared under JFM and ensure implementation scientific forest management.
- 2 Creation of awareness amongst the member of JFM Committee about the role and various benefits may be available in the forest management.
- 3 The forest officials shall act as a facilitator for implementation of various development activities by other departments
- 4 The responsibility and benefit of local people should be thoroughly briefed by forest officials.

While implementing of Joint Forest Management ecological factors combine with social, economic and site specific to provide both opportunities and limitations on the type of management may be considered in particular village. The ecological viability of the forest and status of regeneration are influenced by a range of biological conditions including species compositions, utilization of produce, soil and climate. Joint Forest Management requires strong institutional capacity to make collaborative to efforts for forest protection activities and make it successful ultimately at the end in getting the economic returns and regeneration of the forests. The efforts must be to the extent which will yield sufficient income to sustain the activities of management on perpetual basis. Therefore the forest officials have to take adequate measures and persecutions in formalizing participatory management in a particular forest area. The details of village under JFM implementation are given in the table.

TABLE NO. – 62

**DETAILS OF VILLAGES UNDER JFM IMPLEMENTATION IN PUSAD
FOREST DIVISION**

Sr. No.	Name of JFM committee	Registrati on No. & Date	Range	Area allotted for protection		Plantation area (Ha) (2006 Rain)
				Compt.No.	Area Ha	
1	2	3	4	5	6	7
1	Wadad	441/05	Pusad	350, 351, 356	1207.28	50.00
2	Brahmi	448/05	Pusad	347, 348, 747, 748	976.52	50.00
3	Karhol	128/05	Pusad	364, 365, 366	862.32	50.00
4	Chichghat	129/05	Pusad	361, 362, 363	1043.36	50.00
5	Dhundi	447/05	Pusad	353, 355, 358	1032.00	50.00
6	Bhilwadi	175/05	Digras	344, 345	687.88	50.00
7	Kolura	174/05	Digras	801	157.30	50.00
8	Hiwalni	379/05	Digras	331	516.40	50.00
9	Dhanora Tanda	173/05	Digras	329, 330	737.37	50.00
10	Wadgaon	172/05	Digras	740	450.84	50.00

Sr. No.	Name of JFM committee	Registration No. & Date	Range	Area allotted for protection		Plantation area (Ha) (2006 Rain)
				Compt.No.	Area Ha	
1	2	3	4	5	6	7
11	Patharwadi	177/05	S'Pimpri	425	295.83	50.00
12	Nagwadi	378/05	S'Pimpri	418	605.43	50.00
13	Jamnaik	400/05	S'Pimpri	454	713.92	50.00
14	Amdari	501/05	S'Pimpri	457, 861, 751	748.18	50.00
15	Mansal	229/05	S'Pimpri	403	237.75	50.00
16	Amdapur	222/05	Mahagoan	471	336.31	50.00
17	Jamb	222/05	Mahagoan	477	362.61	50.00
18	Shirmal	244/05	Mahagoan	480	428.50	50.00
19	Borgaon	248/05	Mahagoan	483	374.75	50.00
20	Shankarwadi	220/05	Mahagoan	452	339.54	50.00
21	Piranji	348/05	Umarkhed	462	252.90	50.00
22	Govindpur	357/05	Umarkhed	464	344.80	50.00
23	Janun	355/05	Umarkhed	440	288.25	50.00
24	Botha	356/05	Umarkhed	431	403.49	50.00
25	Amdari	354/05	Umarkhed	433	251.60	50.00
26	Devranga	327/05	Bitergaon	434	404.29	50.00
27	Manyali	329/05	Bitergaon	505	465.61	75.00
28	Ganeshwadi	328/05	Bitergaon	494	1078.13	25.00
29	Pimpalgaon	326/05	Bitergaon	495	772.97	50.00
30	Chikhali	330/05	Bitergaon	482	1021.17	50.00

Various GR's, Orders and guidelines in relation to JFM are given in appendix No.LIX of Volume II of the present Draft Plan.

SECTION VII .10 :- ACTIVE PARTICIPATION

It is the proper duty and responsibility of forest officials to create awareness among the members of Forest Protection committee as well as villagers about the importance of forest, its intangible benefits and protection of the forest from fire, illicit felling, encroachment, grazing, etc. The active participation of local people must be

encouraged in management protection and development of the activities of the forest assigned to them. For achieving effective results in this regards it is required to take up regular efforts like taking of meeting, conducting of workshops and visit to successful areas shall be arranged to explain about the protection of forest and achievement and other communities. A comprehensive fire protection scheme shall be prepared and explained to JFM members for prevention and protection of forest from fire. The Forest Protection Committee members shall be made to aware of their duties and responsibilities to have their active participation in the protection and management the forests. Therefore, increase the usufructs will be obtained from the assigned areas which will ultimate play roll to improvement of economy of JFM members as well as the forest areas will be restored and improved.

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CHAPTER VIII

WORKING PLAN FOR WILDLIFE MANAGEMENT(OVER LAPPING) WORKING CIRCLE

SECTION VIII.1 :- GENERAL CONSTITUTION OF THE WORKING CIRCLE.

This working circle includes entire forest area covered by all working circle of the division. The total area covered by this working circle is above 69435.26 ha.

The Pusad forest division has been natural habitat for verity of wild animals. The forests are mainly teak bearing along with its natural associates of miscellaneous species which form dense patches at some places specially along with the river Painganga. Therefore the Wild Life has been mostly concentrated in these areas. The history of wild life indicates good verity of wild life inhabitat in this tract but due to indiscriminate shooting, poaching and shikar by poachers, the wild life in this tract dwindling at alarming rate. Other important factors for dwindling wild life are liberal issue of crop protection license, Poisoning of animals and various development activities that have been implemented in this area.

SECTION VIII.2 :- THE STATUS AND DISTRIBUTION OF WILDLIFE

The wild fauna are widely distributed in the dense patches of the forests. The wild animals commonly found in this tract are as follows.

TABLE NO. – 63

**TABLE SHOWING DISTRIBUTION OF WILD LIFE IN PUSAD DIVISION
(As per Census on dated 22 & 23 May 2005)**

Chital	Barking Deer	Nilgai	Chous inga	Black Buck	Wolf	Jackle	Wild Bor	Hyena
64	111	731	25	25	32	28	370	5
Jungle Cat	Langoor	Rhesas Monkey	Hare	Mungus	Pea-cock	Owl	Chin-kara	Sloth Bear
26	630	289	58	10	483	2	27	14

SECTION VIII.3 :- SPECIAL OBJECTS OF MANAGEMENT :-

1. To protect and conserve Wild Life in this area.
2. To ensure maintenance of viable population of Wild Life.
3. To increase the population of Wild Life by providing by proper habitat management including shelter, water, food, etc.
4. To preserve the areas of biological importance for all times to come as natural heritage for the benefit of education, research and enjoyment of the people.
5. To involve local people in Wild Life conservation.
6. To enhance the scope of employment potential and additional income generation by propenting Eco-Tourism in the areas where ever there is potential.

SECTION VIII.4 :- DISTRIBUTION OF WILD LIFE :-

Fragmentation of habitation, degradation of shelter, refuse fodder and scarcity of water are some of the reasons for dwindling of wild animals population in this tract. These factors are coupled with Man-Wild Life conflict, ineffective protection of wild life. Further lead to decline of wild life population. The other factors which cause declining of wild life or shrinkage of forest coverage due to heavy biotic pressure, poaching. Lack of understanding about the Wild Life conservation among the people etc.

Distribution of Wild Animals in different parts of the division are

- A. Mammals:-Panther** (*Panthera pardus*). **Hyaena** (*Hyaena hyaena*) **Jackal** (*Canis aureus*). Indian fox (*Vulpes bengalensis*). Jungle cat (*Felis chaus*) are common among the carnivores and Black buck (*Antelope cervicapra*), spotted deer (*Axis axis*), Blue bull (*Boselaphus tragocamelus*) sloth bear (*Melursus ursinus*) Wild boar (*Sus scrofa*), common langur (*Presbytis pileatus*) and Indian hare (*Lepus nigricollis*) among the herbivores.

- B. Birds:-** The area supports rich avi-fauna. Apart from common birds Pea fowl (*Pavo cristatus*). Grey Jungle fowl (*Gallus sonneratii*), Painted partridge (*Francolinus pictus*), common quail (*Coturnix coturnix*) and crow pheasant (*Centropus sinensis*) have been regularly sighted in the forest areas.
- C. Reptiles:-** Red sand boa (*Eryx conicus*), Indian cobra (*Naja naja*), Python (*Python molurus*), Rat snake (*Ptyas mucosus*), Varanus sp, Chameleon sp.
- D. Fish:-** Catla (*Catla catla*), Rohu (*Labeo rohita*), Carp (*Cyprinus carpio*),

The wild flora found in Pusad Forest division have been listed and mentioned below :-

Upper Storey:- Teak (*Tectona grandis*) is principal species and main associates are Dhawda (*Anogeisus latifolia*), Ain (*Terminalia alata*), Tiwas (*Ougenia dalbergioides*), Lendia (*Lagerstroemia parviflora*) and Tendu (*Disopyros melanoxylon*). Some of the other associates are satpudi (*Dalbergia paniculata*), Bhirra (*Chlooxylon swetenia*), Kalam (*Mtragyna parviflora*), Rohan (*Soymida febrifuga*), Salai (*Boswellia serrata*), Semal (*Bombax ceiba*), Beheda (*Terminalia bellirica*). Shisham (*Dalbergia latifolia*), Bija (*Pterocarpus marsupium*) and Bel (*Aegle marmelos*).

Under Storey:- The understorey consists of trees the shrubs, grasses and climbers. The major species are-

Trees:- Amaltash (*Cassia fistula*), Aonla (*Emblica officinalis*), Char (*Buchanania lanzan*), Dudhi (*Wrightia tinctoria*), Ghoti (*Zizyphus xylocarpa*), Palas (*Butea monosperma*), Dhaman (*Grewia tiliacifolia*), Moyen (*Lannea grandis*), Bartondi (*Morinda tinctoria*), Lokhandi (*Ixora parviflora*).

Shrubs:- Bharati (*Gymnosporia montana*), Parijatak (*Nyctanthus arbortristis*), Moroghali – (*Helicteres isora*), Dhayati (*Woodfordia fruticosa*), Raymunya (*Lantana camara*), Tendu (*Diospyros melanoxylon*).

Grasses:- Bhurbhusi (*Eragrostis tenella*), Kodmor (*Apluda varia*), Marvel (*Andropogon annulatus*), Dub (*Cynodon dactylon*), Paonya (*Schima sulcatum*).

Climbers:- Palasvel (*Butea superba*), Mahul (*Bauhinia vahlli*), Pivervel (*Combretum ovalifolium*), Chilati (*Acacia pinnata*), Iruni (*Zizyphus oenoplia*) Gunj (*Abrus precatorius*), Ran kand (*Dioscorea bulbifera*) Ran draksh (*Vitex tenuifolia*)

SECTION VIII.5 :- LEGAL POSITION :-

Acts have been enacted to protect and preserve wild life from time to time. In 1972 a compressive legislation called Wild Life Protection 1972 was enacted by the Government of India. This act supersedes all other acts which were enacted prior to this act as far as Wild Life Protection is concerned. This act provides for effective protection and preservation of Wild Life, restriction on hunting and regulation of trade in Wild Animals articles made out of Wild Animals. There are number of modifications carried out for effective control over the wild life protected areas i.e. Wild Life Sanctuaries, National Parks and Zoos, etc. from time to time.

Latest amendment passed by the Government of India for the Wild Life (Protection) Amendment Act 1991 which came into force w.e.f. October 2nd 1991 except Section 35, 44, 55c, Chapter III A & IV A. The silent features of the amended act is as follows.

1. The world game reserve, Big game, Small game have been deleted from the act.
2. Hunting of the Wild Animals of scheduled I, II, III & IV of the act has been completely banned except as per the provisions of Sec. 11.
3. Protection of specified plants has been introduced and included in a new chapter IIIA.
4. Section 29 of the act has been amended which facilitated not to carry out exploitation in the Sanctuary areas.
5. A new section has been included which provides that no arm license shall be issued within 10 Kms. of a Sanctuary without prior permission of Chief Wild Life Warden.
6. Ban has been imposed and dealing with imported ivory and articles made therefrom.
7. A new chapter IV A has been included to provide Central Zoo Authority and recognition of Zoos.
8. Penalties for wild life offences have be substantially enhanced under Sec. 51 of Wild Life (Protection) Act 1972.
9. Sec. 61 (1) has been amended in such a way that the power to make any change in the scheduled of the act vests only with the Central Government.

SECTION VIII.6 :- INJURIES TO WILD LIFE :-

The wild life in this area dwindled over a period of time due to various reasons like poaching, fire, water, etc.

1. **Poaching :-** Poaching due to development of infrastructural facilities, specially roads and communication in the interior areas leads to the accessibility of the areas of wild life. The out side poachers or the poachers adjoining to forest and the meat lovers can easily reach to the interior areas and kill the animals for various purposes.
2. **Fire :-** The tract of Pusad division is subjected to repeated fires every year which cause extensive damage to the wild life and its habitat. Repeated fires cause accessibility of wild animals to human habitations and provides opportunity to be hunted. Fires in vegetation, bring about changes in vegetal cover and quality in vegetations which may be detrimental to the survival of wild life in perpetuity due to destruction of the habitats.
3. **Water :-** In this tract most of the streams and water courses will be dried during Summer seasons leaving few water bodies. The wild animals are required to visit limited water holes at least twice in a day. The fact is that the water holes will become hunting places for poachers during summer season.

SECTION VIII.7:- MEASURES TO BE UNDERTAKEN TO PROTECT WILD LIFE :-

1. Periodical estimation survey of wild animal is a must to assess the population of wild animal and their distribution in the tract which help in taking up appropriate measures to protect and manage habitats.
2. In summer most of the water bodies and streams shall dry up and wild animals are required to visit water holes twice in a day for drinking and the water bodies may be vulnerable spots for poaching, therefore it is prescribed alternative water resources and water shall be provided in the form of water holes at appropriate places where the wild animals can meet their water demands safely.

3. In Pusad forest division in some of the areas alternative water sources are provided by means of Anicuts, Van Talav & water holes. These water holes will be filled up with water on a regular basis and these should be strictly protected from poaching.
4. Multipurpose Watch Towers will be erected to observe the movement of wild animals and to trace the fire incidence for fire control and to check grazing.
5. Salt licks and dust and mud bars shall be provided at suitable places.
6. Census shall be conducted regularly to assess the status of wild animal population.
7. Vaccination of the cattle grazing in the forest shall be carried out in order to prevent contagious diseases to wild animals and grazing process are required to be verified regularly.
8. The cattle kill and human kill cases are required to decide promptly and the compensation shall be paid as per the Government policy.

Involvement of Joint Forest Management Committee in Protection of Wild Life :-

The Man-Animal conflict has been there in the nature from the time in memorial. The developmental activities for the benefit of human always cause damage to wild animal existence. To protect wild animals effectively, the cooperation and active participation of local people is necessary. In Joint Forest Management the wild life protection should be a focal point. The wild life should not be considered as competing in utilization of resources in the forest but it is to be looked upon as co - sharer of common resources. It is the need of the hour that there should be a symbiotic relationship between mankind and wild life in a particular habitat. The wild life protection shall be entrusted to Joint Forest Management committee and the funds flow for wild life protection and management shall invariably through Joint Forest Management committees. Efforts shall be made to have a fair competition among various Joint Forest Management committee for the protection of wild life as well as other natural resources.

CHAPTER – IX

ECO-TOURISM IN PUSAD FOREST DIVISION

SECTION : IXB.1 : NEED OF ECO – TOURISM :

IX.1.1. Eco – Tourism is a new concept in forest management, and it has gained momentum in the recent past. Eco-Tourism in this tract encompasses entire area of the division. The tract is rich in distinct flora and fauna, natural resources, natural landscapes, natural scenic beauty of various irrigation projects contribute enormous potential for Eco tourism in this tract. Keeping in view the above mentioned potential resources a separate chapter on Eco – tourism has been formulated.

IX.1.2 As per “Eco – Tourism in India – Policy and Guidelines, 1998”, Ministry of Tourism, Government of India : Eco - Tourism can be defined as follows : **“The activities of persons traveling to and staying in places outside their usual place of residence for not more than one consecutive year for leisure, business or other purposes constitute tourism. Such visits for being close to enjoy its enormous creations, both biotic and abiotic, in most environment - friendly manner, without any adverse impact on the ecosystem, is particularly known as eco tourism.”** The tract of Pusad division forms a distinct vegetation cover with important rivers like the Painganga, the Arunavati, the Pus.

IX.1.3 According to World Tourism Organisation (WTO), **“Tourism that involves traveling to relatively undisturbed natural areas with specified object of studying, admiring and enjoying the scenery and its wild plants and animals, as well as existing cultural aspects (both of the past or the present) found in this areas”** is defined as ecotourism. Nature tourism (ecotourism) is distinguished from mass tourism or resort tourism by having a lower impact on the environment and by requiring less infrastructure development.

IX.1.4 The key elements of ecotourism include a natural environment as the prime attraction, an optimum number of environment-friendly visitors, activities which do not have any serious impact on the eco system and the positive involvement of the local community in maintaining the ecological balance.

IX.1.5 Ecotourism provides pleasure of beautiful natural forest or landscape-watching of animals, birds and trees in forests and engaging in trekking, boating or rafting, corals and marine life, wandering in sand dunes zones are some of the common forms of eco tourism.

SECTION IXB.2 : GENERAL CHARACTER OF VEGETATION, LANDSCAPE

IX.2.1. The vegetation of this tract is “**Southern Tropical dry, deciduous**” with varied floristic composition, Edaphic and climatic variations. The forest situated along the river Painganga and its tributaries is of better quality which represents site quality III and IV A. Pusad forest division has got many spots with beautiful vegetation. Some of which are mentioned below.

1. THE FORESTS OF KHANDALA :-

This area comes under Marwadi block situated on low hill ranges. This beautiful forest tract represented with mainly teak and its natural associates like Ain, Dhawada, Lendia, Kalam, Tiwas, etc. with unlimited Herbs, Shrubs, the spiriling climbers embracing and curling the trees are definitely memorise the ongoing visitors to this spot. Prancing herds of Chital, serene voices of barking of deer, chirping of Jungle Fowl, peacock and other birds and wandering of Nilgai will definitely memorise the visitors to this spot. The presence of cunning Leopard and dancing sloth bear are bound to attract anybody to watch the nature and its abode.

There is a huge percolation tank in the midst of the forest on the way Khandala to Junona in compartment no. 397, 398, 395 & 400, which can be a beautiful spot to attract tourists to the spot.

2. KARLA HOLI SPOT :-

This is situated 5 km. away from Pusad on the way to Shembalpimpri in compartment no. 407, 406 & 404. The deity is lord Shiva and Krishna situated in the midst of the forests. Peoples of many religions go to the temple and pray to the gods. A very big pilgrim being organized in the month of February on the Eve of new year day. The temple is surrounded by beautiful vegetation having crop composition of teak with its associates like Ain, Dhawada, Lendia, Kulu, Haldu. Wild animals like Chital, Nilgai, Panther, Sloth bear, etc. and wild birds like Peacock, Jungle Fowl, etc. will definitely attract the tourist to this spot, apart from the temples of lord Shiva and Krishna.

3. AMBALI MAHANUBHAV TEMPLE :-

It is situated in compartment number 438,427,431 & 432 of Umerkhed range. This temple is surrounded by bountiful natural forest with verity of vegetation. There is a perennial source of Nala in which water available throughout year. Many pilgrims from all over India visit to the place during the period of “Datta Jayanti.” The presence of wild animals and verity of vegetation will bound to memorise the tourist apart from the temple of lord Krishna.

4. ARUNAVATI IRRIGATION PROJECT :-

This project has been completed recently having extremely beautiful surroundings with forests. Some of the tourists visit to the spot specially on holidays. This is a huge dam which attract many animals and birds to the spot and the tourist who visits the spot will take pleasure of both forest as well as wild animals. It can be developed for boating as it is full of water through out the year. This project is situated in compartment no. 776,743 & 771 of Digras range.

5. ANCHALESHWAR LORD SHIVA TEMPLE :-

This is one of the oldest temple of lord Shiva situated in the forest of Shembalpimpri range in compartment no. 414, 415 & 416. This temple encompassed by beautiful natural of forest. The temple is situated on the hill of having water on one side and forest on the other side. The back water of major irrigation project of Isapur provides cool atmosphere through out the year in this area. Many wild birds and wild animals visit to the water course.

A big Jatra being organized on the eve of “Mahashivratri” every year and many pilgrims from different parts of the state visit to this place. The back water of Isapur dam and the forest with more of miscellaneous species are attracting aspects apart from the temple of Lord Shiva.

These eco tourism spots can be developed for the attraction of tourists without disturbing the nature’s bounty.

SECTION IX.3: SPECIAL OBJECTS OF MANAGEMENT :-

IX.3.1. In the National Wild Life Action Plan 2002, the special objects of management of eco-tourism states that tourism should become a unifying force nationally, internationally fostering better understanding through travel. It should also help to preserve, retain and enrich, the life style and cultural expression and heritage in all its manifestations. The policy objective of eco-tourism could involve a selective approach, scientific planning, effective control and continuous monitoring. To develop the process of eco tourism shall meet the following cardinal principles.

1. It should involve the local community and lead to the over all development area.
2. It should identify likely conflicts between resource use of tourism and livelihood of local inhabitants.
3. The development of tourism should be compatible in environment and the socio-cultural aspects of local people.
4. It should focus overall development strategy with better land use plan and expansion of public services.

The special objects evolved on the basis of above mentioned cardinal principles are :-

1. Development of eco tourism without disturbing socio-cultural and ecological environment of the area or with low impact on it.
2. Involvement of local people and over all socio-economic development by maintaining ecological balance.

3. Exposer to ethnic groups to the main stream of social, cultural and temporal life and involve them in harnessing potential of eco tourism for their development.
4. Involvement of Government and non Government organizations to create awareness for environment.

SECTION IXB.4 ROLE OF FOREST DEPARTMENT :-

IX.4.1. The forest department will develop the centers of ecotourism with controlled accessible points at strategic places. Eco tourism centres include roads, self guided nature drive, transport options interpretation centers, signs, observation towers, adequate lodging and dining facilities, garbage disposal facility and other amenities as per the requirement. Any development of buildings and other infrastructural facilities shall be eco-friendly.

IX.4.2. Specify environmental, physical and social carrying capacity to limit the developmental activities. The division will provide information regarding 1) What to see ?, 2) How to see ?, 3) How to behave ?, by providing brochures, leaflets and specified guides and visitor information centres.

IX.4.3. Division will prepare and distribute code of conduct to all visitors. Organising training programme for forest personal and general public and JFM committees to enhance the eco-tourism.

SECTION IX.5:CODE OF CONDUCT AND EXCEPTIONS FROM VISITORS

IX.5.1. Proper guidelines shall be prepared and the visitors shall be abide by these guidelines.

- i. The habitats of flora, fauna and any sites of natural or cultural shall not be affected by tourism.
- ii. Make no open fires and discourage others from doing so. If water is to be heated with scarce firewood, use as little as possible. Where feasible, use kerosene or fuel efficient wood stove.
- iii. Remove litter, burn or bury paper, and carry back non degradable litter.

- iv. Keep local water clean and avoid using pollutants such as detergents in streams or springs. If no toilet facilities are available, try to relieve yourself at least 30 meters away from water sources and bury or cover the waste.
- v. Plants should be left to flourish in their natural environment and avoid taking away cuttings, seeds and roots.
- vi. Leave the camp sides clean after use.
- vii. Remember that another party will be using the same camp side after your departure.
- viii. Help guides and porters should follow conservation measures. Do not allow groups / porters to throw garbage in the streams or rivers.
- ix. Respect the natural and cultural heritage of the area and follow local customs.
- x. Respect local etiquette and wear loose cloths. Kissing in public is disapproved off.
- xi. Respect privacy of individuals and ask permission and use retrained in taking photographs of local inhabitants.
- xii. Respect holy places. Do not or remove religious objects.
- xiii. Strictly follow the guidelines for personal safety and security and always take your own precautions and safety measures.

SECTION IXB.6: ROLE OF NON GOVERNMENT ORGANIZATIONS :-

IX.6.1 The N.G.Os will be allowed to take lead in eco tourism in this tract and harness the potential of eco tourism for the development of local people. The role of N.G.O. will be creation of awareness in all aspects of eco tourism, motivation of local community in participation of sustainable eco-tourism activity. Conducting trainings in easy guiding of eco-tourism, catering, transportation, affording house, etc.

SECTION IX.7 ROLE OF COMMUNITY :-

IX.7.1. The local people by participating in all aspects of eco- tourism development and make the outsiders aware about, without disturbing eco logical and biological balance available in the tract.

IX.7.2. JFM members with forest department shall act as efficient caterers, guide to eco-tourists.

IX.7.3. To be friendly with visitors and help them in eco-tourism practice.

IX.7.4. Practice conservation of nature and culture as a way of life.

IX.7.5. Respect the values of environment flora and fauna, the monuments and their cultural heritage.

SECTION IXB.8: THE ENVIRONMENTAL PLEDGE :-

IX.8.1. While promoting eco tourism in the tract environment pledge shall be displayed at strategic places. The environment pledge shall indicate about publicity on recycle paper, disposal of polythene bag, garbage disposal, alternate source of energy for fuel, water catchment and treatment, eco friendly lodging and resorts, planting of saplings, etc.

CHAPTER NO. X

WORKING PLAN FOR FOREST PROTECTION (OVERLAPPING)

WORKING CIRCLE :-

SECTION X.1: INTRODUCTION :-

The forest protection is one of the most important and difficult aspects of forest management. Lot of degradation of forest has already been taken place due to increased of human and cattle population and consequently their requirements. The developmental works carried out under five year plans resulted in diversion of forest land for non forestry purposes i.e. cultivation, irrigation projects, industries, etc. lead to shrinkage of forest cover as well as reduction in forest area. This situation resulted in huge gap between demand and supply for forest produce.

The inclination of people towards tangible short term individual benefits rather than intangible gains for long term well being of society as such are some of the leading causes which work against the interest of forest protection.

In the National Working Plan Code of 2004 the Government of India made it mandatory to have Forest Protection (Overlapping) Working Circle in working plan after duly considering the problems of forest protection. The forest protection is a complex problems of management which requires multifranged approach for solution.

In this working circle the entire area of Pusad division has been included. The forest of this division have tremendous pressure of illicit felling, encroachment, grazing and fire because of excessive biotic pressure of the adjoining villagers and nature of vegetation, climate and social factors. As most of the forest constitutes maximum teak, the problem of illicit felling is more acute in the patches where teak percentage is more specially the forest of Umerkhed which are adjoining to state border of Andhra Pradesh and Maharashtra. There has been a perpetual threat of illicit felling along the Nanded district border. In this division out of 84 beats 33 beats are designated as Hyper sensitive and 26 Sensitive beats. All 59 beats constitutes 69435.26 Ha. of forest area.

The average volume per ha. as per the enumeration data is about 38.99 cub.mtr., therefore the total volume comes around 2709971.09 Cub.mtr considering the total forest area as 69435.26 Ha. The market value for this much existing value of timber, fuel wood has the market worth of about 2168 cores considering market value of Cub.mtr worth Rs.8000/-. This is a huge forest wealth contributes to the state as well as national economy by providing both tangible and intangible benefits, which required to be protected by all means. Therefore, there is a need to create a separate Forest Protection (Over Lapping) Working Circle, accordingly this working circle is provided in the management plan which highlights the problems of forest protection in the area along with probable solutions for forest protection. Number of various offence cases as under.

TABLE NO. – 64
STATEMENT SHOWING NUMBER OF OFFENCE CASES

YEAR	FIRE	GRAZING	ILLICIT FELLING	OTHER	TOTAL
1995-1996	53	1764	53	117	1987
1996-1997	57	71	1502	113	1743
1997-1998	8	62	1391	95	155
1998-1999	54	33	1056	40	1183
1999-2000	34	26	1207	58	1332
2000-2001	40	2	1101	39	1206
2001-2002	12	12	1205	133	1376
2002-2003	21	1269	12	84	1388
2003-2004	25	1367	16	102	1510
2004-2005	1	1000	13	90	1104
2005-2006	23	1143	76	41	1283

SECTION X.2 :- GENERAL CONSTITUTION :-

This overlapping working circle covers entire area of Pusad division.

SECTION X.3 :- SPECIAL OBJECTS OF MANAGEMENT :-

1. To protect the forest from illicit felling, encroachment, fire and grazing.
2. To sensitize local people about forest protection and involve them in preventing forest offences by taking their cooperation.

SECTION X.4 :- STRATEGY FOR FOREST PROTECTION :-

The strategy to be adopted to protect forest is of integrated approach and it shall be applied at various fronts by undertaking collective measures based on situation and time. The strategy shall be direct field oriented in a participatory manner with active involvement and co-operation of local people specially members of Joint Forest Management committee. Total villages in this division are 267 whereas 174 Forest Guards are placed at various places to protect the forest. Therefore, for effective protection there is a need to seek the co operation and involve local people in forest protection. Some of the effective measures proposed are.

1. Existing forest needs to be well protected and developmental works like soil and moisture conservation measures, Natural and Artificial Regeneration works and other cultural operations shall be carried out in order to increase the productivity of the forests.
2. Regulation of grazing and controlling the fire.
3. The seeking co- operative and active participation of local people in all operations of forest management.
4. Employment generation to local people during lean period.
5. Fulfilling the demands of local people for forest produce.
6. Effective utilization of existing infrastructure, strengthen and updating infra-structural facilities.

7. Installation of new Check Nakas at Hyper Sensitive and Sensitive points apart from existing Check Nakas.
8. Improvement in communication facility and mobility of the forest staff.
9. Patrolling the sensitive forest areas along with the local people / Joint Forest Management Committee members.
10. Introducing Rewards and Awards and informer system and making the forest offence high risk low gain process.

The forest protection can not be achieved in isolation without active participation and co operation of local people in other words Joint Forest Management approach will be the main strategy to protect existing forests of the division.

SECTION X.5 :- FOREST PROTECTION :-

The most important factors for the degradation of forest cover and forest land shall be dealt with the following points.

Illicit Felling :- It is the major problem in this division. The forests area along with border of Andhra Pradesh and Nanded district are sensitive from the point of illicit felling. To have effective protection regular patrolling needs to be undertaken by the field staff and the members of the Joint Forest Management Committee as “Shramdan”. In order to control the illicit felling in transit new Check Nakas to be established apart from existing Check Nakas at sensitive and hyper sensitive places. The vehicle and enforcing staff shall always be kept ready for contingent situation. The early detection of illicit felling cases, prosecution in the court of law and making list of habitual offender.

There is a need to create local network system for information by providing cash incentive to the staff as well as local people those who help in providing information for nabbing offender and seizing the illicitly felled material.

Presently there are 16 Check Nakas are established at various strategic points to control the transportation of illicit forest produce and six more Nakas are proposed to be established.

The Check Nakas must be duly notified by competent authority and published for the benefit of public as well as law enforcing authorities.

TABLE NO. – 65

LIST OF SANCTIONED NAKAS & PROPOSED NAKAS

Sr.No.	Range	Sanctioned Naka	Temporary Naka	Proposed Naka
1	2	3	4	5
1	Pusad	0	3	1
2	Shembalpimpri	1	2	1
3	Umerkhed	1	2	1
4	Mahagaon	0	0	2
5	Bitargaon	1	2	1
6	Digras	0	1	0
Total		3	10	6

These Check Nakas are manned by Forest Guard and Van Majoer and they do not have modern system of communication like Waky Talky or Wireless connection. It is required to strengthen existing Check Nakas with effective controlling force i.e. manpower and modern communication system.

1. MOBILE SQUAD :-

The Dy. Conservator of Forests has been provided one Mobile Squad Range Forest Officer with the staff of Range Forest Officer 1, Forester 1, Forest Guard 4, Forest Labors 1, Police constable 1, And Driver 1 along with a Jeep. The Mobile Squad Range Forest Officer will supervise the protection of entire Pusad division and he works directly under the control of Dy. Conservator of Forests, Pusad division.

The Government have issued various directions and circulars from time to time in relation to dealing of forest offences. The Government have given direction vide its letter no. TRS-1087/102380/F-2/R & FD, Dt. 18th June 1981. The offences of illicit felling valuing Rs.25,000/- & more at a place should be reported directly to the Government within 3 days after receipt of report from the Range Forest Officer by the Chief Conservator of Forests, Conservator of Forests and Dy.Conservator of Forests.

The following time scheduled has been provided for inspection of illicit felling areas by respective areas.

Sr. No.	In situ value of illicit cutting at a place	Designation of the Inspecting Officer	Period within which inspection should be completed
1	Upto Rs.50000/-	RFO	3 days from detection/ receipt of intimation of detection
2	Above Rs.50000/- but not exceeding Rs.2,00,000/-	ACF	3 days from the receipt of information.
3	Above Rs.200000/- but not exceeding Rs.500000/-	Dy.C.F.	3 days from the receipt of information.
4	Above Rs.500000/-	CF	7 days from the receipt of information.

The Government vide its letter no.TRs-1082/36/F-6, Dt. 8th September 1982 directed the department to launch the offence cases above Rs.2,000/- in court of law for prosecution unless the prosecution is difficult to succeed .

2. WIRELESS NETWORK :-

Presently there is no Wireless network in this division. In the present day society modern type of communication has become easy and faster and the offenders making use of modern communication system like Mobiles in committing forest offences and transporting the forest produce. As this type of modern system of communication is not

provided to the staff, they find it difficult to prevent the forest offences or to nab the forest offenders. Therefore it is prescribed modern communication system should be provided for effective protection of the forest.

3. MOBILITY OF THE STAFF :-

In Pusad division 5 vehicles are provided for Dy.Conservator of Forests, Assistant Conservator of Forests and Range Forest Officer Mobile Squad and 1 Pick-up Van for Protection. With the existing road network by using modern speedy vehicles, the forest offenders are easily transporting the illicit material to the converting and utilizing points within the State or out side the State. The Territorial Range Forest Officer are not provided with any mode of transportation for patrolling and protecting forest property. It is prescribed that the staff involved in the protection of forest area shall be provided with modern and effective transportation facilities. It is necessary to provide jeeps to the territorial range officers for effective mobility to control forest officers.

As good quality of forest along Painganga rivers offenders from Marathwada and Andhra Pradesh including in illicit felling in this belt and transport the illicitly felled material with the help of Boats or by way of Rafters to the point of convenient. Therefore it is needed to provide Motor Boat for patrolling along Painganga river.

4. PROVISION OF ARMS :-

The forest offenders are resorting to use modern weapons like fire arms in committing forest offences. The forest staff without modern weapons it is difficult to prevent those offenders from committing forest offences. With a view of providing weapons to the forest staff the Government have provided a few number of weapons to the staff for forest protection and for self protection. The fire arms provided to the staff members are not sufficient to deal with the offenders and the fire arms may be provided even to the lower rank staff those who involved in forest protection.

5. TERRITORIAL INSPECTIONS :-

1. Beat checking :- In order to have stringent protection of forest it is necessary that the protective staff required to carry out patrolling in their respective jurisdictions and the officers concern will exercise effective supervision and control at all levels. It is utmost necessary to report every forest offence promptly as per directions given in the standing order 37, chapter 9. The instructions issued for the guidance and strict compliance with a view to take effective measures in relation to efficient forest protection as given below.

- xiv. **Beat Guard :-** Every Beat Guard must carry out patrolling in his beat regularly. After thorough, inspection of entire forest area of his jurisdiction of every fortnight and issue POR for all the damages detected in his beat within the 1st instant.
- xv. **Round Officer :-** The Round Officer of a round is required to inspect each beat at least once in 3 months and he should verify and enumerate the damage not reported by the concern Beat Guard . His report must reach to the Dy. Conservator of Forests through Range Forest Officer after thorough inspection.
- xvi. **Range Officer :-** The primary responsibility of the Range Forest Officer is to verify whether the Round officer and Forest Guard are carrying proper patrolling of the forests of their jurisdiction or not. He should inspect a specific portion covering at lest 1/4th of the area of the Beat once in 6 months and the findings are required to submitted to Dy. Conservator of Forests and Conservator of Forests punctually. In case of the quantum of illicit felling is more the Range Forest Officer will take appropriate measures to inspect Beat thoroughly.

- xvii. **Supervisory Officer :-** The supervisory officer while on tours will inspect the specific areas of illicit felling. It is prescribed that the supervisory officer must spend one day for inspection of such vulnerable area within 15 days.

The forest offences shall be reviewed regularly at various levels regarding the nature of offence, quantum of offence, whether the case is compoundable or required to launch in court of law, etc.

While dealing forest offences the offences not only booked under the provisions of Indian Forest Act 1927, Wild Life (Protection) Act 1972, Forest Conservation Act 1980 but also these cases shall be dealt in content in IPC, CRPC, etc for effectiveness of the case.

2. Transit rules for Forest Produce :- The regulation of transportation of forest produce under Bombay Transit of Forest Rules 1960 published by the Agriculture and Forest Department under No. IFA-1057/22947-(VI), Dt. 23rd April 1960. The Government of Maharashtra vide its notification no. 1083/91822/(II)/CR 87/F-6, Dt. May 30th 1995 has amended Section 61 of Indian Forest Act 1927 making the law more stringent. Under this amendment some of the Assistant Conservator of Forests and above have been designated as Authorised officers for the purpose of this act who are competent to confiscate the vehicles, instruments, forest produces, etc. involve in forest offences related to the illicit removal of notified forest produce.

The provisions of Government vide letter no. TRS-1089/PK-27/89/F-6, Dt. May 14th 1990 stated that the transit pass shall be issued within 45 days from submission of application.

6. FIRE PROTECTION :-

The areas of Pusad Forest Division are subjected to repeated fires due to heavy biotic pressure and the nature of vegetation and atmosphere due to deciduous nature and the dry climate. Fire caused extensive damage to the forest specially the regeneration, forest growth, ground flora, soil organisms and the soil productivity.

Prevention of fires and effective control of fires as prescribed in the plan is essential for the forest development. The fall of leaf litter on the ground combined with highly combustible under growth consist of dens grasses, even a thin spark and trigger of a conflagration in a short time. In summer high speed of hot winds make the fire to spread easily when it occurs and wrangle rest of area before it can be brought under control by counter firing.

The areas needed to be protected from fire are classified into the following categories based on purpose of fire protection.

1. Class I :- Forest completely protected ; This area includes.

- ii. All main felling coupes, thinning coupes, all the forest of protection working circle, teak plantation working circle and improvement working circle.
- iii. All regenerated coupes of all working circle till the young crop has attained the age of 10 years.
- iv. All plantations.
- v. All forest nurseries.
- vi. All Government timber depot both permanent and temporary.
- vii. Special habitat areas of any other special important areas as specified by the concerned circle incharge.
- viii. These areas are cleared with appropriate width of fire line as per the guide lines and patrolled by fire watchers. If any fire incidence takes place in this area is treated as calamity and should be reported to the concern Dy.Conservator of Forests in detail.

2. Class II :- (General Fire Protection):-

- i. The remaining areas of Selection cum Improvement working circle.
- ii. The all other areas as specially directed by the circle incharge of Yavatmal Circle on special grounds.
- iii. These areas are separated from surrounding areas by means of external fire lines and will be divided into suitable blocks of interior fire lines and no guidelines will be cut. Fire watchers may be engaged as sanctioned by the concern circle incharge.

3. Class III :- (Forests Protected by Law only) :- Those categories which are not included in class I and II are included in this class. Generally deliberate burning is prohibited and no special measures of fire protection will be undertaken. The following categories of fire lines will be maintained kept clean of all the growth and combustible material.

- i. All external boundaries of reserve forest to the extent of width of 12 mtrs.
- ii. 6th mtr width around all the plantation upto 10th year from planting.
- iii. 3 mtr. wide coupe lines upto 10 years of main felling.
- iv. 6 mtr. wide line on both sides all along the roads and car tracts that are passing through forests.
- v. 40 mtr. wide around timber and fuel wood depots.

To control and reduce fire the following operations shall be undertaken.

1. The cutting and cleaning of fire lines shall be completed by end of December and control burning shall be combined by end of February.
2. Whatever leaf litter that falls on the fire lines shall be collected from time to time and burn before the fire season starts.
3. No fire line shall be burnt after February unless there is a special order from the concerned Dy. Conservator of Forests.

7. FIRE CONTROL MEASURES :-

1. A consolidated fire protection scheme shall be prepared in consistent with the prescription given in the working plan with the provisions of watch point, strategic location, fire watcher at each location, deployment of vehicles and the supervisory forest staff.
2. The fire watchers and the forest staff are required to be given training in fire protection and handling of fire fighting tools.
3. The fire watcher shall constantly patrol the areas of class I and class II.
4. The fire watching towers shall be erected at a strategic points where the fire watchers sit on the tower observe location of fire.
5. After receiving information the fire watchers move in group to particular location and extinguish fire with the help of fire fighting tools.
6. The division office will maintain a register of fire lines showing the length and width of fire line and the period of cutting and burning and a consolidated map will be prepared based on the actual position of the fire lines. Any negligence in fire protection duty shall be viewed as devaluation of duty and the supervisory officer must extensively tour in the area and verify the fire control measures.
7. The members of Joint Forest Management committee shall be involved in the fire protection and their participation and cooperation shall be obtained to have effective fire protection.
8. The vehicles that are available will be deployed at strategic location where the fire protection gangs can reach easily when ever they requires vehicles. These vehicles are means for transporting fire protection labourers and fire protection equipments.

8. LEGAL PROVISIONS AVAILABLE :-

The Indian Forest Act 1927 provides legal measures to control forest fires under some of the sections of the act.

I. Reserve Forests :- (The following acts are prohibited in the reserve forest under the provision of Indian Forest Act 1927).

1. Indian Forest Act 1927, Sec. 26 (1) (b) – to set fire.
2. Indian Forest Act 1927, Sec 26 (1) (c) – handling, keeping and carrying any fire except such season as the forest officer may notify in this behalf.
3. Sec. 26 (1) (f) – burning of any tree.
4. Sec. 26 (1) (g) – burning of lime or charcoal.
5. Sec. 26 (3) – The State Government may suspend or exercise of all rights of pasture or forest produce in the reserve forest whenever the fire is caused willfully.

II. Village Forests :- Sec. 28 (3).

As per the section all the provisions for fire control exists in reserve forest will be equally applied to village forests.

III. Protected Forests :- Sec. 33 (1) (a) (b) (d) (e) and 30.

Provide all legal measures to control the fire incidences in the protected forests.

IV. Provisions contained in the Maharashtra Forest (Protection of forest from fires) Rules 1982 under Indian Forest Act 1927, Sec. 32 (6), 76 (1) (d) the Government of Maharashtra made rules for the protection of Protected forest from fire called as Maharashtra Forest (Protection of Forest from fires) rules 1982 and issue notification no. 1074/252379/F-6, dt. February 14th 1982.

V. Various provisions made under Rule 3 to 7.

Rule 3 :- A ban is imposed on handling of fire from 1 km. of forest boundary.

Rule 4 :- If any body wants to make a fire line in the forest beyond 1 km. distance from the boundary, he has to clear at least 10 kms. wide on either side of area which he proposes to burn and he should keep fire watchers.

Rule 5 :- Under this rule anybody desires to burn rab he should inform to the nearest forest officer one week in advance.

Rule 6 :- Under this rule any person who collects inflammable forest produce such as grass, fire wood, leaves, bamboos, who is a permit holder shall stock in the open space from a reasonable distance of the forests.

Rule 7 :- Under this rule the camping places along the boundary of within the limits of forest area shall be cleared and the visitors are not allowed to such areas.

Provisions contained in Bombay Forest Manual :-

Volume II, Part IV :-

Rule 52 :- Under B.F.M. Vol. II, part IV Rule no. 150 to 160 the legal provisions are available for dealing with the offences of forest fires.

Apart from the legal provisions provided in the above acts. The legal provisions are also available under Maharashtra Minor Forest Produce (Regulation of Trade) 1969, Maharashtra felling of Trees (Regulation) Act 1964 and Protection of Bamboo Areas from Fire after flowering are to control fires in different type of forests.

9. FOREST FIRES :-

When ever the fire incidence or smoke is seen raising any where in or near the forest by any forest staff. He shall immediately rush to the spot along with necessary aid and extinguish the fire. If the fire is outside his jurisdiction he will continue till the fire is extinguish and the concern staff arrives on the spot.

Proper care should be taken to extinguish fire completely and ensure that there should not be any burning material which may cause fire again and he should be covered with soil.

10. USE OF WIRELESS :-

For effective communication use of modern communication system like wireless is necessary and a separate scheme shall be prepared for establishment of wireless network in the entire division. This system not only helps in fire protection but also use full in overall forest protection.

11. RESPONSIBILITY :-

The Range Forest Officer is personally responsible for efficient fire protection in his range. If there is a common boundary in 2 ranges the responsibility of clearing fire line will be decided by the Dy. Conservator of Forests, Pusad. In case of common boundary in 2 divisions the fire line cutting and maintenance will be decided by the concern circle incharge.

The Dy. Conservator of Forests, Pusad is personally responsible for carrying out efficiently all prohibited and protective measures in this regards in his jurisdiction. The Dy. Conservator of Forests, Pusad Division must satisfy himself that external fire lines and other fire lines are prepared before February by carrying out extensive tours in the area. He is required to move in the jurisdiction extensively during fire season and during his tour must keep a strict watch on fire protection by means of local enquires and inspections. A constant watch should be kept on Tendu contractors and their agents who engage local labours to put fire to the forest to get good flash of Tendu leaves. The period is generally form 1st March to 15th April of every year.

12. FIRE REPORTS :-

If any fire incidence takes place the concerned Range Forest Officer must inform to concern Dy. Conservator of Forests at once. If necessary through special messengers. The Range Forest Officer must keep a proper communication and co - ordination with the Dy.C.F. Pusad. After the fire is extinguished, a detail report shall be submitted to Dy.C.F. Pusad with extent of area, damage, value of damage with the detail map within 15 days.

The Dy.C.F. Pusad shall submit monthly return in prescribed proforma (no. IX-74) to the Chief Conservator of Forests showing serial number of fires, date of occurrence, cause, area burnt, extent of damage and the steps taken to extinguish fire. A register of fire record shall be maintained by Dy.C.F. Pusad giving details of length fire line Class I,II & III. The fire incidence that takes place in class I, II, III areas shall be indicated with different marks on the map.

The deliberate burning of debris on silviculture principles to encourage regeneration need not be included in fire protection scheme and fire should not spread out side the targeted area. The deliberate burning is admissible. It is sanctioned in working plan or by Conservator of Forests. Such operation shall be carried out in consultation with Dy.C.F.

SECTION X.6 :- GRAZING CONTROL :-

Two major minaces like fire and grazing hamper the success of regeneration of forest to a great extent. In Pusad Forest division due to heavy cattle population pressure the forest have been degraded to a great extent specially those forest which are sitouated adjoining villages. The number of villages in this division is 262 whereas the number of compartment is 270, which means there is one village in each compartment. The 'C' class Reserve Forests are excessively grazed, therefore these forests are mostly open or scrub type. The carrying capacity of the forest area of Pusad division is about 79397 cattle units in 69435.26 Ha. of open forest areas. The Government of Maharashtra formulated the grazing policy vide its resolution no. MFP-1365/1322-Y, Dt. 6/12/1968 and the grazing rules were framed vide its G.R. no. MFP/137/237035-Z, Dt. 3/11/1973. According to which the grazing to be allowed as per the carrying capacity of each class of forest. The grazing incidence in SCI working circle area comes to 1.3 ha and for catchment and afforestation working circle it comes about 0.6 to 0.8 cattle per Ha.

The main felling coupes of all working circles will remain closed for a period of 10 years from the main felling as the felling cycle is fixed at 20 years, 1/4th area of the felling series will remain closed for grazing at any time. All the forests are not possible to open for grazing at a time and as the cattle population is not uniformly distributed therefore it is prescribed the cattle exceeding carrying capacity of an area open for grazing should not be allowed to enter into the forest. The excess cattle units can be

managed through fodder development activity on common community lands and waste lands. The villagers shall be persuaded to go for stall feeding of some of their cattle which are more than carrying capacity of the forest adjoining to them and the local people shall be educated and made aware of ill-effects of excessive grazing on forests growth. Apart from this the forest staff should open a dialogue with the local villagers to discuss regarding grazing policy, carrying capacity of forests and the area available to graze their cattle in the adjoining forests. The Dy. Conservator of Forests of Pusad division by considering all the factors should prepare a consolidated plan based on area, cattle units, carrying capacity, rotational grazing and avenue for excess cattle units.

SECTION X.7 :- ENCROACHMENT :-

The problem of encroachment is common in almost all the areas specially the forest areas located adjoining to habitations. The problem of encroachment shall be mainly because lack of appropriate survey and demarcation on the ground, the greed of the people and the apathy of local people towards Government lands. In order to mitigate the problem, it is essential to take up survey and demarcation works on top priority. Precast pillars of 1st and 2nd class type shall be erected after the survey is over which can be completed in a phase manner. The existing cairns shall be repaired and maintained under 1/5th boundary demarcation scheme. The powers that were entrusted to the officers of Assistant Conservator of Forests and above rank under Sec. 53 and 54 of Land Revenue Code will effectively be utilized. The encroachment if any can be tried summarily and evicted as early as possible.

SECTION X.8 :- ROLE OF JOINT FOREST MANAGEMENT :-

JFM committee will contribute to a large extent in protection of the forest from illicit felling, encroachment fire, grazing, etc provided if the forest staff have a constant dialogue with the members of the committees and involve them for joint patrolling, management and development of the forest.

The JFM committees shall be entrusted with a specific area ear marked them for the protection, management and development of the area. The committee members needed to be given training in technical matters of protection at the same time they should be provided with gainful employment by taking up management and developmental activities in the areas entrusted to them.

CHAPTER. XI

WORKING PLAN FOR MISCELLANEOUS WORKING CIRCLE.

SECTION XI.1:- GENERAL CONSTITUTION :-

This working circle consist of the following area.

1. Areas handed over to other department yet to be disforested. (405.5Ha).
2. The area of 'C' class reserve forest which is less than 10 ha. at one place.

TABLE NO. – 66

CATEGORY WISE AREA OF MISCELLANEOUS WORKING CIRCLE

Range	'A' Class area handed over to other Dept. (Ha.)	'C' Class area handed over to other dept. (Ha.)	'C' Class area balance and yet to be given Compt. no. (Ha.)
Digras	191.88	429.98	248.34
Pusad	167.63	--	16.10
Umarkhed	33.14	--	--
Shembalpimpri	--	231.71	30.57
Mahagaon	12.89	287.85	18.04
Total	405.54	949.20	313.05

SECTION XI 2 :- GENERAL CHARACTERISTICS OF VEGETATION :-

The nature of vegetation is of scrub or open type with poor quality of teak in few pockets. Majority of the area has already been handed over to other department.

SECTION XI 3 :- METHOD OF TREATMENT :-

1. The areas which were handed over to other departments will have the same legal status until they are denotified. Therefore it is prescribed that a proposal shall be mooted to denotify these areas and necessary entries should be made in form no. 1 after denotification.
2. The 'C' class reserve forest is mostly opened and scrub which are nearer to habitations. These areas shall be properly demarcated and these shall be brought under forestry uses, such as nursery, forest garden, medicinal plants, forest demonstrative plots, eco tourism, residential accommodation of staff and other forestry activities depending upon the suitability of the area and availability of funds.

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CHAPTER NO. XII

MISCELANEOUS REGULATIONS

SECTION XII.1.1. DEMARCATION AND MARKING TECHNIQUES :

The coupes due for felling shall be demarcated one year in advance of its due year except first year coupe no. I of main operation in which demarcations, marking and main operation of felling will be carried out in first year of operation of working plan. It is in view of working of last year of main operation of working to be carried out in that particular year itself. as given in Appendix no.XLI(A). After demarcation a treatment map will be prepared by the Range Forest Office and it should be verified by the Asstt. Conservator of Forests. After the coupe is demarcated along with treatment map coupe demarcation certificate will be furnished by concern Range Forest Officer in the following format.

I, -----, RFO, -----certify that I have personally inspected the demarcation of coupe No. -----in compartment No -----of ----- FS ----- WC on dated -----month ----- year ----- and have prepared the treatment map as per the prescriptions of the working plan for Pusad Forest Division.

The area of the coupe is ----- ha.

Place -----

Date-----

Signature

(-----)

(Range Forest Office-----)

Place

Countersign

Date-----

(-----)

Assistant Conservator of Forests,-----)

After demarcation having been certified by the RFO, stock map and treatment map shall be prepared by the Assistant Conservator of Forests or the RFO concerned as given in

the working circle. The areas distinguished for the purpose of marking, shall be delimited as per the instructions given in the text of the plan report.

A. Demarcation and Preparation of treatment map :-

1. The coupes due for felling will be demarcated by cutting and clearing the bushy under growth with a 3 mtr. width of line. Pillars of 2 mtr. height will be erected in the middle of the line at suitable intervals (one pillar should be visible from the other) except where the coupe boundary coincides with a permanent feature like a big Nala, Fire line or Road. The Pillars will bear coupes details like coupe number, name of felling series, compartment number, year and working circle on the side away from the coupe area.

2. The boundary trees of the coupes will be given 2 coal tar bands and Geru band in between after scraping loose dead bark. The lower coal tar band shall be at breast height while upper coal tar band will be 15 cms. above it. These trees so selected shall be above 45 cms girth and selected at suitable intervals. These trees will be numbered serially and number to be at just below lower coal tar band and the numbers will be entered in the marking register in the following form.

Sr. No.	Species	GBH	Remarks
1	2	3	4

3. No tree will be marked for felling.

B. Demarcation of Sections :-

1. For the effective management of the coupe each coupe will be divided into 4 sections approximately having equal areas. The sectional line shall have 1.5 mtr. width line and the lines are prepared by cutting and clearing brush wood except the section lines coincides with the permanent features.
2. The trees above 45 GBH selected at suitable intervals and the inner edge of 1.5 mtr. wide cleared section line will be given 2 coal tar bands 15 cms apart, the

lower one being at the breast height just below lower coal tar band. Section number will be given on the side away from the area they would denote.

C. Demarcation of Protection areas :-

On the periphery of protection areas trees will be selected and given 2 Geru Bands, 15 cm. apart and lower band being at GBH. Apart from this a cross (X) in Geru colour between 2 bands will be given on the opposite side of protection areas. All these trees shall be serially numbered and the number will be given below the lower Geru band on the side bearing the cross. All protection areas will be numbered in Roman numerals and the standing tree on the periphery of each protection area will be numbered in Arabic. Identification with separated series in each area so that the periphery trees of each protected area will be a Separate series of Roman numerals. The periphery trees marked with a number should not be felled.

TABLE NO. – 67

Sr.No.	Species	Girth at bhobem	Remarks
1	2	3	4
1/1	Ain	140	Not to be felled
11/1	Dhaoda	90	Not to be felled
111/1	Anjanwak	150	Not to be felled

D. Marking Technique :-

1. All the trees to be marked for felling will be given a Geru band at breast height and base the impression marking hammer at the breast as well as at the bottom by marking a clear blaze of size 10 cm. X 10 cm.

2. The following trees will bare a digit Sr. No. of both breast height and base. A) All trees of Teak, Bija, Shisham, Ain, Tiwas, Haldu, Dhawada and Shivan of 45 cms and above in girth at breast height to over bark. B) Trees of all other species of 60 cms and above girth at breast height.
3. All remaining trees marked will base a Sr. No. which will be given coal tar. The digital and coal tar numbers will form a separate series. Only malformed trees will be recorded as full trees except that of teak and a tree shall be categorized as fuel tree, when it is not capable of yielding any sawn timber or pole.
4. All the trees baring Sr.No. will be duly recorded in marking book with the following details.

Sr.No.		Species	Girth at bhobem	Remarks
Digital	Coal Tar			

5. The abstract of trees marked for felling will be given in 15 cm girth classes. Timber, Poles and fuel wood trees will be shown separately. The marking number on the trees will be put in vertical direction as shown below.

2

For eg. Tree no. 245 --->

4

5

SECTION XII.1.2 :- HARVESTING AND DISPOSAL OF FOREST PRODUCTS :-

1. Timber and Fire wood :-

All the marked coupes of main felling will be worked departmentally or allotted to FLCs or as per the policy of the Government. However the tending operations like thinning need to be carried out only through department as it highly technical. All the

timber and firewood shall be extracted to Government depot or duly sanctioned depots by the competent authority for sale or auction or disposal. Timber, poles and fire wood to be given on “Nistar” at concessional rate shall be kept separately in these depots.

2. Tendu Leaves :-

The trade of Tendu leaves have been nationalized with the enactment of “Maharashtra Minor Forest Produce (Regulation of Trade) Act 1969”. The disposal of tendu leaves as per the procedure laid down in the act and for this purpose tendu areas this division divided into 18 tendu units. Tendu units are sold in accordance with the provisions of this act by the Chief Conservator of Forests (Evaluation and Nationalisation), M.S. Nagpur.

3. Grasses :-

The instructions contained in G.R.No.MFP-1169/118931 – (6) – F-2, Dt. 29/10/1976 will facilitate the disposal of grass coupes. The grass from closed coupes will annually be offered on cutting terms to Grampanchyats, Public bodies or FLCs of adjoining area at a reasonable prize fixed by the department. If the Grampanchyat or the public bodies are not interested in purchasing grass coupes, it may be auctioned or may sold by rated passes. To encourage stall feeding the villagers may be allow grass free of cost without damaging forests.

4. Gums :-

In this area Dhawda gum is extracted and it is disposed through tender system by forming units. While tapping gum, making injuries to trees should be avoided and non destructive harvesting method will be adopted.

5. General :-

The sound and young growth of all important species yielding NWFP or medicinal plants such as Mahua, Hirda, Behada, Aonla, Charoli, Tendu, fruits, etc. will be retained in areas ear marked for harvesting in such a manner that they are suitably disposed and would also serve as subsidiary crop to main species and NWFP to people residing in and around the forests.

SECTION XII.1.3 :- IRREGULAR HARVESTING :-

Irregular harvesting of any forest produce such as Timber, Fire Wood, NWFP, etc. is prohibited except in the following cases.

1. Removal of dead, fallen and fire wood and wind fallen trees except coupe due for working will be carried out as per the procedure mentioned below.

The Beat Guard shall prepare compartment wise availability of dead, fallen fire wood and wind fallen and report to concern Range Forest Officer in the month of October. The Range Forest Officer will then prepare compartment wise estimates for such material by marking these trees. While marking 2 dead trees will be left for the benefit of wild life in the forest. The material is extracted by the Range Forest Officer after obtaining estimate sanction and due permission by the concern Dy. Conservator of Forests. The material so extracted from the forest may be given to Grampanchyat or Forest Protection Committee at concessional rates as sanctioned by the Conservator of Forests or disposed off as per the existing Government policy in this regard. The material extracted and the manner in which it is disposed shall be entered in compartment history. The Felling of trees on fire lines if necessary may be carried out with the permission of Dy. Conservator of Forests with reference to Conservator of Forests regarding the approval of fire line and its category for which the Conservator of Forests is to decided whether the fire line is to be maintained or not.

2. Approval of felling of trees under electric line and telephone line existing prior to enforcement of Forest Conservation 1980 or after that may be given by the Dy. Conservator of Forests as per the sanctioned accorded by the competent authority.

3. Removal of trees on forest land by other agency required by other department like irrigation. PWD, etc shall be undertaken after their proposals for the use of forest land for non forestry purposes or sanction by Government of India under Forest Conservation Act 1980. The cost for removal shall be born by concern department.

4. Felling of trees for the purpose of study, research for preparation of volume table, yield table shall be carried out by the working plan wing and the permission is not required to obtain from Central Government except giving details of plan of work to the territorial Conservator of Forests well in advance getting sanctioned from him. The felling should be restricted to only objects of work proposed.

5. Disposal of forest produce obtained from submergence areas of dams and tanks and from construction of roads etc. will be carried out as per the instructions of competent authority.

6. Irregular harvesting will not be carried out for the purpose of undertaking plantations / afforestation works under various schemes. Outside the scope of the working plan and in any of the areas under this plan.

7. **Removal of dead trees :-** Some times due to insects , fungus attacks there is a large scale mortality of pole or tree crop and removal of such trees shall be permitted as a part of irregular harvesting.

8. This high stumps are left over by the illicit cutters shall be cut and flushed to the ground after preparation of inventory of such stumps and duly verified by the Assistant Conservator of Forests.

9. Some times the leaning trees may become dangerous to public as well as private property likely to cause damage shall be removed as under regular harvesting.

SECTION XII.1.4.:- MAINTENANCE OF THE BOUNDARIES :-

The present state of boundary maintenance in Pusad division is not up to the mark. The Reserve Forest boundaries though they are clearly demarcated on the ground, the boundary marks are not seen at many places. The survey and demarcation of 'C' class Reserve Forests has not been yet completed. The observations made that the boundary demarcation between the Reserve forest and adjoining private agriculture field or revenue land is not clearly distinguishable therefore it is necessary for the Dy.C.F. Pusad Forest division should take up place the work on top priority and get the area demarcated and prepare accurate maps. The maps of the division were prepared showing boundary pillars & should be given to working plan wing. The external and internal boundaries will be maintained in accordance with the 1/5th boundary demarcation scheme as given in Appendix no. XLVIII the boundaries of the forest shall be maintained as details given below.

1. The outer boundary of Government forest shall be maintained with a clearcut width of 12 mtr. The under growth that inhibits the view and prevents one forest boundary marks being seen from the neighbouring one shall be cleared. The boundary trees shall not be removed so long as they do not obstruct the view of boundary marks one from the other except where natural features forms the boundaries. After clear cut demarcation on the ground cairns erected. The Principal Chief Conservator of Forests letter dt. 29/5/2001 issued instructions regarding specifications such as shape, description, foundation, dimensions, colour wash, etc. of boundary marks (Cairns). The boundary marks shall be erected at such a convenient place both can be seen from one place to another place. Generally the distance between 2 cairns is of 500 mtr. if the line is straight. Each boundary pillar will bear a sr.no. and a fresh series shall be given to each adjoining village.

SECTION XII.1.5 :- BOUNDARY MARKS SPECIFICATIONS :-

1. The boundary marks specifications shall be as approved by the Principal Chief conservator of Forests, Maharashtra State.
2. Apart from boundary marks tin plates will be fixed on the boundary trees at a height of 3 mtrs. preferably at the boundary of the compartments. These plates will indicate the compartment numbers with the arrows and below them will be pillar number on either side of plate. The metal plate will be of 45X45 cm. size. This will be painted with white, compartment number and pillar number will be written in red colour. Special attention needs to be taken in annual maintenance of boundary marks.
 - i. Whether the boundary pillars are correctly located as per the map and demarcation register.
 - ii. The boundary width is to the extent of required measurement or not.
 - iii. Regular maintenance of cairns and wooden post is replaced where necessary.
 - iv. That the boundary post bare the correct number and same is engraved and written in coal tar or paint.
 - v. If any encroachments are there the matter should be persuaded and removed.

SECTION XII.1.6 :- RULES FOR INSPECTION AND MAINTENANCE OF FOREST BOUNDARIES :-

1. The Forest Guard of concern beat is mainly responsible to protect and maintain the boundary pillars every year. He himself colour wash them annually after rains and make a special report after completing this job. All boundary marks shall be specially inspected by the beat guard at least once in year in his beat. The boundary marks inspection will be mentioned in his diary and sent it to Range Forest Officer.
2. The Round Officer is also equally responsible for protection and maintenance of all boundary marks in the forest in his round. He is required to see proper maintenance and colour wash by the beat guard as directed. Round Officer is responsible to inspect all boundary marks in a year which are due for maintenance and repairs as per 1/5th boundary demarcation scheme. This matter will be mentioned in diary and send it to Range Forest Officer.

I Shri, ----- R.O. -----
----- certify that the annual length of the boundary lines as prescribed under the scheme given in the Appendix of the Working Plan for Pusad division has been verified by me personally and that boundary line and marks are found to be correct as per the maps. I further certify that each cairn bears a correct serial number and next cairn is visible from either side of each cairn. There are no encroachments or encroachments are as detailed below.

Signature of the R.O. with date.

3. The Range Forest Officer will be required to check 25% of annual boundary line as per the 5 year programme and 5% verification will be done by Assistant conservator of Forests.

SECTION XII.1.7 :- MAINTENANCE OF COMPARTMENT BOUNDARIES :-

The compartment boundary shall be maintained regularly by clearing under growth to the extent of 3 mtr. width except where the boundary coincides with the natural features. Tin plates of compartment boundaries with a size of 30 X 30 cm indicating compartment numbers should be affixed on the trees at a height of 3 mtrs. These plates were painted with white and number shall be put in red colour.

SECTION XII.1.8 :- LEGAL PROVISIONS AVAILABLE FOR MAINTENANCE OF BOUNDARY MARKS :-

Altering, moving, destroying or defacing of any boundary mark of any forest is punishable with an imprisonment for a term up to 2 years or with fine or both under section 63 (c) of Indian Forest Act 1927. This offence is non compoundable, Sec. 68 of Indian Forest Act 1927. A register shall be maintained by Dy. Conservator of Pusa and updated every year after completing of survey and demarcation works as prescribed above. A copy of updated register and corrected maps shall be supplied to Conservator of Forest, Working Plans, Yavatmal every year in the month of June.

SECTION XII.2 :- ARTIFICIAL REGENERATION :-

SECTION XII.2.1 :- Planting of teak and miscellaneous species :-

Plantation of suitable teak and misc. species will be taken up in the following year of main felling as per the suitability of site. Stump planting will be carried out in case of stump planting or root trainer planting where as in case of misc. species root trainer or poly pot planting will be prescribed. The planting works will be carried out as given below.

SECTION XII.2.2 :- Premonsoon works :- These operations will be done in the year of main felling different operations of premonsoon works given below.

Fencing or TCM will be prepared for the protection of plantation. The TCM will be having standard cross section 1.90 X 0.60 X 1.0 mtr. will be dug where the boundary runs along the contour. No TCM will be aligned which runs across the contour and in that case live it fencing shall be undertaken with thorny scrubs like. Acacia Senegal, babul and cutting of shrubs like vitex and Dodonea, etc will be planted.

SECTION XII.2.3 :-Pits digging :- The size of pit will be 30 X 30 cm. for Misc. plantation and the pits digging will be completed before of March and it should be allowed to whether during summer. The pits refilling will be completed before end of May. Generally the number of plants or teak stumps per. ha. is 2500 and the number of plants may be decided on the basis site and model of scheme.

SECTION XII.3 :-Nursery Operations :-

SECTION XII.3.1 :-Teak Stumps :- These will be prepared form one year old seedlings raised on the beds as per standard nursery techniques. The seed sources must be from a known place and duly certified by the competent authority. The stumps will be prepared by following standard technique and 'A' class root shoots shall be used for raising good quality of plantation.

SECTION XII.3.2 :-Misc. Plants :- These plants will be raised in polythene bags by following a standard miscellaneous nursery techniques. Standard size of poly bags for raising misc. plants to obtained optimum size of plants. The nursery will be started by October of the previous year of the planting. The height of plants will vary from species to species. Shifting of poly bags will be taken up with in nursery, every 15 days once the plant attained 10 cm. height however while shifting care should be taken that the plants shall not be damaged. The potting mixture shall be managed properly and application of suitable mixture and fertilizer will be carried out at appropriate intervals. Before plantation good quality, healthy and appropriate size plants will be selected and these will be inspected by the officer not below the rank of Asstt. Conservator of Forests.

1st Year Operation :-

The seed sowing of species of live hedge species shall be taken up in three rows. Planting of Agave on the outer two rows of two edge fencing at a spacement of 15cm and planting of shrub cutting in inner three rows will be done. The teak stump plantation will be done in crowbar holes whereas the polythene bag planting will be done in pits after the on set of monsoon.

Subsequent Operations :-

1st weeding along with causality replacement shall be completed within 20 to 25 days after the plantation is over. 2nd and 3rd weeding will be carried out in the month of September and October respectively. The 3rd weeding shall be coupled with soil working and mulching to reduce vaporization losses. One more soil working will be done in the month of January if there are winter rains, based on availability of funds. Weeding and soil working to the seedlings and livehedge will also improve the growth and survival of plants on live hedge. In the second year plantation the causality replacement will be carried out after onset of monsoon and weedings will be done in the month of August and October respectively. Soil mulching will be carried out along with 2nd weeding. In case of teak, debudding will be done in the month of May. In 3rd year plantation only one weeding along with soil mulching will be done in the month of September. Debudding in teak plantation will be done as in 2nd year.

BAMBOO PLANTATION

To take a Bamboo plantation at suitable areas at a spacemen of 5 mtr. to 5 mtr in the 4th years from the year of main felling if prescription are made in the plan.

Premonsoon works :-

In 3rd year of main felling pits of the size of 45 X 45 X 45 cm. will be dug before March and allow the soil for weathering. Pits refilling will be done at the end of May.

Nursery :-

To raise the stock for Bamboo planting the Nursery will be started two years in advance of planting and maintain in the nursery till the rezomes are formed and these rezomes will be used for planting. The Bamboo Rizome bank will be established at suitable site in each range and bamboo seeds shall be obtained from known sources and sown on beds. After one month the small seedling shall be transplanted to polythene bags after cutting their branches above 3 to 4 nodes. Suitable fertilizer will be applied to achieve proper growth and rizome formation.

1st year operation :-

With the on-set monsoon the Bamboo polypots will be transported to the site and planted in the pits. The casual replacement will be done at the end of July and August 1st week, weeding and soil working will be carried out.

Subsequent Operation :-

In the 2nd, two weeding and soil working in 3rd year one weeding are prescribed and if necessary, insecticide may be applied to protect from termites.

Subsidiary Silvicultural Operations :-

Sec. All these operations shall be carried out departmentally. These operations shall include –

1. CUT BACK OPERATIONS :- CBO shall be carried out in the following year of the main felling.

- i. Climber cutting of entire area.
- ii. Removal of badly damaged or broken trees desiring main felling.
- iii. Cutting back of malformed advance growth.
- iv. The unwanted under growth interfering with the Teak and other Valuable miscellaneous species shall be removed.
- v. The multiple coppice shoots or poles shall be reduced to one per stool.
- vi. In eroded areas or areas liable for erosion soil conservation measures shall be taken up by way of Gully plugging, Nala Bunding, Check Dams, etc.

2. Cleaning :- This operation will be carried out departmentally in the 5th year of main felling.

- i. Climber cutting of entire area of the coupe.
- ii. Removal of damaged and malformed saplings in teak plantation area.
- iii. All coppice shoots shall be completely cut except in areas where planted stock has not come up successfully and in such areas multiple coppice shoots shall be reduced to 1 per stool which is most promising and vigorous one.

- iv. The undesirable growth interfering with teak and other valuable miscellaneous species will be cut.
- v. In the patches of advance growth of teak and other valuable species proper spacing will be created by removing inferior force in tree growth.
- vi. Cleaning of weeds at the base of teak plants and intensive soil mulching shall be carried out immediately after rainy season is over.
- vii. Cleaning shall be carried out before 1st thinning.

3. THINNING :-

a. Thinning in plantations is very much essential and one of the silviculture requirements particularly creation of tree cover to the soil and the spacing is to be created by keeping in mind the number of plants required in a site in relation to age of crop. For appropriate utilization of soil many of the original number of plants of planted have to be removed when they are of little or sale value to permit satisfactory development of those retained. In the plantations thinning operation shall be carried out as per standard technique for thinning in teak plantation.

b. Thinning in Teak plantation :- The 1st thinning will be carried out of the age of 10th year of plantation and subsequent thinnings shall be carried out at the interval of 10 year.

c. Demarcation, Preparation of treatment map and cleaning :- The area due for thinning shall be demarcated on the ground and a treatment map will be prepared by the Range Officer. He will prepare a grid map of 100 X 100 mtrs. Gridwise enumeration of stem of teak of seed origin and coppice origin and other species will be carried out. The treatment map prepared by Range Officer shall be verified by concern ACF and inspected by the Dy.C.F., will have following categories.

- 1. **Type– 1 :-** It will indicate fully stocked areas i.e. successful plantation areas.
- 2. **Type – 2 :-** This type includes patches of failure plantation.
- 3. **Type – 3 :-** It will indicate partially successful and partially failure i.e. areas having teak stumps not conforming to stand table.

Cleaning of teak plantation is very much essential as teak is highly susceptible to root competition and removal of unwanted growth will allow the valuable and promising stumps to attain proper growth. In young plantations lot of unwanted bushes and weeds come up which will be required to remove for healthy growth of plantation. The rate for cleaning shall be fixed by Chief Conservator of Forests (T).

d. Thinning Procedure for old plantation :- 1st thinning shall be carried out at the age of 10 years and it is of B grade thinning. First of all age of the plantation shall be ascertained with available data of plantation or carrying out stem analysis of few stumps. In the plantation gridwise enumeration of tree shall be carried out and these will be listed in the following table.

TABLE NO. - 68

Sr. No.	GBHOB	Species		Origin	Status	Remarks
		Teak	Non Teak	Seed/ Coppice	D/D/S/ M	
1	45	Teak		Seed	D	To be retained
2	51		Ain	Seed	D	To be felled
3	36	Teak		Coppice	S	To be felled

Where:

GBH(OB)- girth at breast height over bark.

D- Dominant.

C- Codominant

S- Supressed.

M- Malformed.

I- Intermediate.

The grid wise average girth of the crop will be computed. The basal area will be ascertained with the help of wedge prism. The basal area will be the average of basal area obtained from at least 3 places and after obtaining average girth and basal area, the data will be compared with the stand table. If the basal area of the crop is more than that in stand table for corresponding age then the thinning will be carried out in the following procedure. (If the basal area of the

crop is equal or less than that of stand table then no thinning shall be carried out except dead teak and all misc. species)

The non teak species will be marked for felling except fruit bearing species and the teak trees of coppice origin will be marked for felling. After that the malformed, suppressed, intermediate, co dominant and dominant species will be marked for felling in respective order to the extent of number of marked trees for felling are available leaving behind retained number of trees confirming to stand table data of number of crop girth and basal area. The retained stumps shall be uniformly distributed over the area. After confirming marking with the stand table these marked trees shall be felled. After that the basal area will be obtained with the help of wedge prism by means of stand table leaving the marked trees from total count. If it is comparable to stand table then marking is perfect.

In case of old teak plantation in which thinning had not been carried out and the crop is congested the above principle shall not be applicable. Instead of that, the average girth of the stand will be worked out on the basis of average girth the corresponding age nearest to the multiple of 5 mtr. higher side will be read from stand table then the thinning will be carried out as if the crop of that age. utmost care shall be taken that over thinning will not be carried out. The thinning shall be carried out through department and after thinning the area shall be protected from fire and grazing. The stand table is given in appendix No. LII of Volume II can be used as reference to carry out thinning.

FIRE PROTECTION :-

Repeated fires cause intensive damage to the forest in the form of damaging flora and fauna, young crop, regeneration and fertility of soil. The forest of Pusad division shall be protected from fire by taking up effective protection. For the purpose of fire protection the forest areas are classified into following categories.

1. Class I :- Forest completely protected. This area includes.

- i. All main felling coupes, thinning coupes, all the forest of protection working circle, teak plantation working circle and improvement working circle.
- ii. All regenerated coupes of all working circle till the young crop has attained the age of 10 years.
- iii. All plantations.
- iv. All forest nurseries.
- v. All Government timber depot both permanent and temporary.
- vi. Special habitat areas of any other special important areas as specified by the concern circle incharge.
- vii. These areas are cleared with appropriate width of fire line as per the guide lines are patrolled by fire watchers. If any fire incidence takes place in this area is treated as climate & should be reported to the concern Dy.Conservator of Forests in detail.

2. Class II :- (General Fire Protection):-

- i. The remaining areas of Selection cum Improvement working circle.
- ii. The all other areas as specially directed by the circle incharge of Yavatmal Circle on special grounds.
- iii. These areas are separated from surrounding areas by means of external fire lines and will be divided into suitable blocks of interior fire lines and no guidelines will be cut. Fire watchers may be engaged as sanctioned by the concern circle incharge.

3. Class III :- Those categories which are not included in class I and II are included in this class. Generally deliberate burning is prohibited and no special measures of fire protection will be undertaken. The following categories of fire lines will be maintained kept clean of all the under growth combustible material.

- i. All external boundaries of reserve forest to the extent of width of 12 mtrs.
- ii. 6th mtr width around all the plantation upto 10th year from planting.
- iii. 3 mtr. wide coupe lines upto 10 years of main felling.
- iv. 6 mtr. wide line on both sides all along the roads and cart tracts that are passing through forests.
- v. 40 mtr. wide around timber and fuel wood depots.

To control and reduce fire the following operations shall be undertaken.

- a. The cutting and cleaning of fire lines shall be completed by end of December and control burning shall be completed by end of February.
- b. Whatever leaf litter that falls on the fire lines shall be collected from time to time and burn before the fire season starts.

No fire line shall be burnt after February unless there is a special order from the concern Dy. Conservator of Forests.

SECTION XII.4 :- GRAZING CONTROL :-

Two major menaces like fire and grazing hamper the success of regeneration of forest to a great extent. In Pusad Forest division due to heavy cattle population pressure the forest have been degraded to a great extent specially those forest which are situated adjoining villages. The number of villages in this division is 262 whereas the number of compartment is 270, which means there is one village in each compartment. The 'C' class Reserve Forest are excessively grazed therefore these forests are mostly open or scrub type. The carrying capacity of the forest area of Pusad division is about 79397 cattle units in 59715.09 Ha. of open forest areas. The Government of Maharashtra formulated the grazing policy vide its resolution no. MFP-1365/1322-Y, Dt. 6/12/1968 and the grazing rules were framed vide its G.R. no. MFP/137/237035-Z, Dt. 3/11/1973. According to which the grazing to be allowed as per the carrying capacity of each class of forest. The grazing incidence in SCI working circle area comes to 1.3 ha and for catchment and afforestation working circle it comes about 0.6 to 0.8 cattle per Ha. The Government Resolution No. MFP-1371/1237035-Z is given in Appendix No. LX (a and b) of volume II.

The main felling coupes of all working circles will remain closed for a period of 10 years from the main felling as the felling cycle is fixed at 20 years, 1/4th area of the felling series will remain close for grazing at any time. All the forest are not possible to open for grazing at a time and as the cattle population is not uniformly distributed therefore it is prescribed the cattle exceeding carrying capacity of an area open for grazing should not be allowed to enter into the forests. The excess cattle units can be managed through fodder development activity on common community lands and wastelands. The villagers shall be perused to go for stall feeding of some of their cattle which are more than carrying capacity of the forest adjoining to them and the local people shall be educated and made aware of ill-effects of excessive grazing on forest growth. Apart from this the forest staff should open a dialogue with the local villagers to discuss regarding grazing policy, carrying capacity of forest and the area available to graze their cattle in the adjoining forests. The Dy. Conservator of Forests of Pusad division by considering all the factors should prepare a consolidated grazing plan based on area, cattle units, carrying capacity, rotational grazing and avenue for excess cattle units.

SECTION XII.5 :-SOIL AND MOISTURE CONSERVATION MEASURES :-

Due to increase in human and cattle population the forests of Pusad division are subjected to heavy biotic pressure resulted degradation of forest, compaction of soil, poor percolation of water, heavy run off, etc. Most of the forest area adjoining to habitations the forests are with little or no humus lead to little sub-soil moisture. All the above factors contribute to the non establishment of natural regeneration teak and its associates, although, the natural regeneration of various species appear but they do not get established as they die before getting established. To rejuvenate the soil conditions of the areas of Pusad division the soil and moisture conservation works are of utmost importance. The Dy. Conservator of Forests will prepare a consolidated plan for soil and moisture conservation measures for entire division including cantour trenching, nala bunding, check dams, etc. after thorough survey of the entire division.

Cantour trenching :- In the areas where the density is less than 0.4, CCT will be taken up all over the coupe area due for working. The trench will be 30 cm. deep and 60 cm

wide. The soil after digging will be heaped on lower side of trenches. Planting of grasses tussocks planted and sowing of grass seeds shall be taken up and local shrub species like vitex, dudovoa, Ipomea and agave bulbils will be planted on the heap for stabilization of the soil at the onset of mansoon. The contour intervals between two trenches will be 1.5 mtr. and it will vary based on slope and distance and contour trenches.

	Slope	Distance between consecutive trenches
1.	0° to 10°	10 mtr.
2.	10° to 25°	5 mtr.
3.	Above 25°	3 – 4 mtrs.

The trenches near the nala will be discontinued and will be curved upwards and both sides of Nala at an angle of 45°, In order to prevent the runoff of water stored in trenches. The curved position will be of 5 mtr. length on both sides of Nala/ Check dams. The main purpose of Nala bund or Check dams to reduce the run off of water and to arrest siltation. Nala bunding will be from ridge to valley. Nala bunds and check dams will be constructed by using loose boulders available on nala bands. No blasting or digging will be done if boulders are not available, brush wood may be used for this purpose. Simple Nala bunds will be effective to the extent of 8 mtr. length, beyond that these structures are not useful and permanent engineering structured will be required to design nala bunds. The nalas have been divided into 3 categories. 1) upto 4 mtr. width. 2) 4 to 6 mtr. width, 3) and 6 to 8 mtr. width. The nala bunds shall be approved by competent authority and the design must be form one side of bed to the other side of bed. The boulder pitching in a semi circular fashion on the top of the bunds so that the stones are compacts and are not washed away by water. The distance between two successful bunds will be such that standing on the site of lower bund the base of upper bund should be the line of eye sight of the person standing on the nala. In general the distance between successive bunds for different slopes will be the same as that for contour trenches. These nala bunding and check dams shall be on the basis of watershed management.

Some of the design of nala bunding are given in Appendix number L(a) of volume II.

DEVIATION :-

1. The following works will not constitute as deviation from the plan.

- i. Removal of dead fallen wood.
- ii. Petty fellings carried out as mentioned in irregular harvesting.

The following works will constitute a deviation from the working plan.

1. The felling and disposal of forest produce for submergence areas of dams, canal sites, road sites and other areas falling under the purview of Forest Conservation Act 1980. The necessary sanction will be obtained.

2. All other deviations can be classified into following categories as per the draft amendment to article 191 and article 192 of Working Plan code vide G.R.no. FWP-10625625 (ii) – J, dt. 25th May 1962 of Agriculture and Forest Department.

- i. Deviation which would seek to alter the schedule of working given in the working plan, The examples of which are both non-working of coupe in the prescribed year or working the coupe in the year not prescribed by the plan. Changes in the areas of coupe on account of disforestation or undertaking areas for execution of any special scheme under plan programme.
- ii. Deviations which would involve alteration in the silvicultural treatment, for example : stopping or curtailing fellings for planting because of shortages of labour, funds, material for plantation works or unsuitability of terrain and soil for understanding plantations to the extent prescribed by the Working Plan. Extensive felling of dry trees killed by fire, fungus, insect attack or other natural calamities. Felling of unusual size and extent for special departmental works, special fellings to meet a sudden new demand of a particular industry. Felling involving modifications in the prescribed marking rules.
- iii. The sanction to all these deviations will be obtained. Application for sanction to such deviation will be submitted sufficiently in

advance, so that such proposals may be received as far as possible before the deviation occurs and without fail before the annual list of deviation is submitted along with the control forms.

Procedure for obtaining sanction for deviation :-

All the deviation proposals required to be approved by the Director General of Forests as per the instructions of Ministry of Agriculture in Government of India letter no. 6-40/84/FRY (WPP), dt. August 23, 1984. The Dy. Conservator of Forests, Pusad will submit deviation proposal in 8 copies to the Chief Conservator of Forests (T), Yavatmal and to the Conservator of Forests, Working Plans, Yavatmal who on scrutinizing the proposals will forward them to Chief Conservator of Forests (T), Yavatmal with his opinion and remarks. The Chief Conservator of Forests (T) will forward to the Chief Conservator of Forests (Working Plan) Nagpur.

The Government of India created a working plan cell in ministry of forest and environment under the Director General of Forests. This cell looks after deviations from prescriptions of approved working plan. Any deviation will be allowed only after getting approval from the Director General of Forests. All proposals for deviations must be maintained in a register of deviation in the division office. Proformae for submission of deviation proposals have been given in the volume II of draft plan.

SECTION XII.6 :- IMPLEMENTATION OF WORKING PLAN :-

The Territorial Chief Conservator of Forests shall ensure all the prescriptions of working plan shall scrupulously implemented by the Dy. Conservator of Forests (T). The work shall be inspected are as under.

Conservator of Forests	2%
Dy. Conservator of Forests	5%
Asstt. Conservator of Forests	20%
RFO/Fr/Forest Guards	100%

The norms for inspection of work are as per the standing orders and circulars issued by Government of Maharashtra and the department in this behalf. Any lapses in discharging responsibilities shall be treated as dereliction of duties and the erring staff is liable for disciplinary action. The Chief Conservator of Forests (T) shall be the competent authority to decide any technical matter prescribed in the working plan and he will guide the subordinate staff in all such matters.

SECTION XII.7 :- SAW MILLS :-

The rules for regulating Saw mills in the state are incorporated in Bombay Forest Rules 1942 and these rules have been updated from time to time.

1. No person shall establish a Saw pit for cutting or converting of timber or manufacturing of Char coal without prior sanction in writing of the Range Forest Officer under Sec. 4 of Indian Forest Act 1927. If the Government declaring that it has been decided to constitute any land as Reserve Forest and for this also above rule is applicable.
2. Within the limits of 80 kms. of any Reserve or Protected Forest any land required in clause (I), no person shall erect or operate any machinery or saw mill for cutting or converting of timber without obtaining license in this behalf.
3. Any person intend to establish a saw pit or manufacturing Charcoal under class (I) of sub rule (1) shall make an application in that behalf to the Range Forest Officer and Dy. Conservator of Forests respectively.
4. If the applicant fails to receive sanction within one month under clause (I) of sub rule (1) the applicant may proceed to establish the saw pit or to manufacture char coal without violating the provisions of the act or any rule made there under.
5. On receipt of an application under sub rule (2) the Range Forest Officer, The Dy. Conservator of Forests shall make such enquiry as he deems fit after satisfying himself regarding the safeguard of forest protection and grant sanctioned or license in the form in scheduled E, subject to the conditions set out there in or refuse to grant the sanctioned of license.

6. Every license granted is renewed under this rule subject to the provisions contained in this rule regarding cancellation, be effective for a period not beyond the day of 31st December from next month following date, the date of issue or renewal. The Dy.Conservator of Forests may on application made to him renew the license issued under sub rule (3) with effect from the date of its expiry.
7. If the licensee does not make application before expiry or failed to renew the license is liable for punishment and can not operate license without renewal.
8. The Dy. Conservator of Forests not with standing contained in the forgoing sub rules may, where he has reason to believe that a licensee is operating a saw mill in contravention with the provisions of these rules and the conditions of rule or the license is indulging in illegal activity which may be detrimental for forest protection, can revoke the license granted under the sub rules.
9. The Dy. Conservator of Forests refuses to issue or renew or any matter related to license, the order shall be communicated to licensee in writing.
10. Any person aggrieved by an order made under sub rule (8), may within 30 days after receipt of order, appeal the Chief Conservator of Forests who shall decide the appeal after giving opportunity for personal hearing. The decision of Chief Conservator of Forests shall be final.

XII.7.1: Subsequently, the State Government has issued amendment vide notification No SWM 1081/ 106836/ F-6, dated 16th July , 1981, the State Government put a ban on issue of new license However, if the applicant has already spent the money and completed the formalities, the licenses can be issued vide SWM 1081/ 106836 (A) F-6, dated August 18, 1981. The licenses of saw mill can be suspended for three months. Saw mill owners are required to maintain three registers by the Government Orders No SWM- 1082/ CR-20/ F-6, R & F D dated February 22, 1984 in Fno, 1- intake, FN2- out- turn, Fno3- disposal Vide SWM 1082/ 2590/ CR/ F-6, dated December 17, 1986, no saw mill can operate after

sunset to sunrise without the written prior permission of the Divisional Forest Officer. The Govt vide letter No. TRS 1081/ 102380/ F-2 R & F D dated July 18, 1981 has laid down the inspection norms of saw mills by the officers or various ranks. The Range Forest Officer is to inspect- twelve, the Assistant Conservator of Forests-6 the Divisional Forest Officer-3 and the Conservator of Forests-1 saw mills in a month.

XII.7.2.: Selection 129 Bombay Forest Rules, 1942 states that who so ever contravenes the provisions of Rule 88, shall be punishable with imprisonment for a term which may extend to six months or with fine which may extend to five hundred rupees or both.

Section : Charcoal kilns :-

Permission shall not be granted to manufacture charcoal to private person in Reserve Forest or Protected Forest or in private areas upto one kilometer boundary from the forests.

Section : Use of Hammer :-

The Territorial Chief Conservator of Forests shall issue guidelines and orders regarding the shape and size of various types of hammer which will be used for the following works.

1. Marking of coupes.
2. POR cases material to be marked by Forest Guard.
3. POR cases material to be marked by Forester.
4. POR cases material to be marked by Range Forest Officer.
5. POR cases material to be marked by Asstt. Conservator of Forests
6. Marking of material from Jungle Depot to Coupe depot.
7. Marking of material from Coupe Depot to Sale Depot.
8. Marking of sold material.
9. Marking of Malki material / timber by ACFs.

SECTION XII.8 :- SCHEDULED RATES FOR OFFENCE CASES MATERIAL

The Chief Conservator of Forests (T) shall sanctioned the scheduled rates for offence case material in consultation with Dy. Conservator of Forests (T) in his circle.

SECTION XII.9 :- TRIBAL WELFARE :-

The forest tribal co – exists and their bond is – inseparable. In order to maintain proper ecological balance, It is necessary to take care the socio economic well being and cultural survival of the tribal. It is extremely difficult to protect the forest without active participation and cooperation of local people. To improve economic standard of tribal by taking up various programmes, industries, safe guarding their domestic needs for forest produce like Bamboo, fire wood and small timber. For all the activities of non wood forest produce a separate non wood forest produce working circle has been constituted.

SECTION XII.10 :- PREVILEGES AND CONCESSIONS FOR FOREST PRODUCE :-

The National Forest Policy 1988 clearly indicated that the local people shall have first charge on forest produce. The forest produce obtained from forest will first be supplied to local people at the rates fixed by Conservator of Forests. The arrangement should be made at such a places nearer to villagers within 2 kms. of radius form their habitation.

SECTION XII.11 :- SMALL TIMBER, POLES AND FIRE WOOD :-

Small timers and poles will be used by local people for agriculture as well as housing construction. Firewood shall be supplied from the local depots at concessional rates. To meet the demand of local people for forest produce such as small timber, poles, fire wood, etc. for constructions and repairs to the houses and for agriculture purposes and fire wood for domestic use will be supplied at concession rates for local depots. These materials after harvesting from the forest as per prescriptions of working plan shall be transported to local depots. The demand of local people shall be obtained through Grampanchyat and their demand for above mentioned material shall be met.

SECTION XII.12 :- METEOROLOGICAL OBSERVATIONS :-

Since there is a well established Meteorological Department in the State with its offices in the rural areas, it is unnecessary to incur expenditure on instruments meant for meteorological observations. The necessary meteorological observations can be obtained from Meteorological Department. However it is necessary to know about number of rainy days and quantum of rain for plantation activities, therefore instruments regarding the same are required to be installed at suitable places. Automatic self recording rain gauge may be used in this connection.

SEC SECTION XII.13 :- BUILDINGS :-

The Pusad Forest Division was created in 1983. There is no building for office of the Dy. Conservator of Forests and presently Dy. C.F. office is accommodated in rental building. The residential buildings available in the division are not sufficient to accommodate entire staff. Therefore the Dy.C.F. , Pusad will be required to prepare a scheme for construction of division office as well as the residential buildings for accommodating the staff those who do not have residential quarters in a phased manner and obtain necessary sanction from competent authority. The details of available building given in Appendix No VII Volume II of this Plan.

Presently maintenance of existing building of offices, Rest Houses and Residential quarters is very poor due to paucity of funds, these buildings require regular maintenance.

SECTION XII.14:- ROADS, CART TRACTS AND CULVERTS :-

The details of Roads, Cart tracts and Culverts have been given in Appendix No.VIII of Volume II. Construction of new roads on the forest land is not permitted under Forest Conservation Act 1980 without prior permission of Government of India. These Roads, Cart tracts and Culverts require regular maintenance for effective management of the forests.

SECTION XII.15 :- ESTABLISHMENT AND LABOUR :-

The total area of the division 69435.26. Some of the patches of forest or very much prone for illicit felling in those pockets the protection staff shall not be entrusted with other activities of management. In other pockets where problems are less for illicit felling, the staff can better implement working plan operations. The Range Officers and subordinate staff shall be properly placed for implementations of working plan operations and the Dy.C.F. Pusad will fix the head quarters of subordinate staff as per the workload. As per the protection problems of the forest the following norms have been fixed for Beat, Round and Ranges.

- a) **Beat Norms :-** 400 to 800 Ha. in thickly populated area, well connected to adjoining Cities and industries and 800 to 1100 Ha. for other areas.
- b) **Round Norms :-** 2000 to 3000 Ha. in the areas there is heavy biotic pressure and for other areas it is 3000 to 4000 Ha.
- c) **Range Norms :-** 95 to 150 Sq. Kms. in thickly populated area and 180 to 225 Sq. Kms. in other areas.

With this new norms the number of Beats, Rounds and Ranges may be increased and existing staff may not be sufficient for implementation of forestry activities. The reorganization of Ranges, Rounds and Beats is necessary as some of the areas are transferred to Painganga Wild Life Sanctuary and FDCM. The Bitergaon Range is hardly left with 5 compartments and to continue entire range staff of Bitergaon range is unnecessary incurring of expenditure on establishment. Therefore it is prescribed to abolish Bitergaon Range and left over 5 compartments in that range may be added to adjoining range.

The available labor force in the local area will be sufficient to carry out working plan operations in this division.

SECTION XII.16 :- MAINTENANCE OF LAND RECORDS :-

The Dy.C.F. Pusad is mainly responsible for maintenance of land records which will constitutes –

1. 7/12 record of all survey numbers belongs to Forest.
2. Village maps on 1:5000 scale shall be procured.
3. A comparative chart of 3 surveys i.e. 'Jamabandi', resurvey and consolidation and different area of forest survey numbers in each survey shall be prepared.
4. 7/12 extract on which the record of right is not mutated in the name of forest department earlier, shall be persued to transfer in the name of forest department. The newly acquired areas shall be persued to transfer in the name of Forest Department.
5. In each 7/12 extract the following entries were recorded. The Government of Maharashtra, forest department, Reserve Forest and Protected Forest. The above entries shall be written on hand writing and no stamps shall be used to show this prescriptions.

SECTION XII.17:- ENCROACHMENT :-

Encroachment is a constant problem for forest protection. The Government of Maharashtra had taken decision in 1978 and 1979 to regularise the encroachment pertaining to period 1/4/1972 to 31/3/1978 and certain conditions laid down to confirm eligible encroachers. Accordingly most of the encroachments pertaining to that period were regularised. However some of the encroachments of that period remain without regularization due to various reasons of non availability of record, encroachments not pertaining to that period, etc.

SECTION XII.18 :- FOREST CONSERVATION ACT IMPLEMENTATION :-

In Pusad Forest Division there are 3 major, 3 medium and 14 minor irrigation projects are existing in the division. For construction of these projects 635.66 Ha. of forest area has been diverted and the legal status of the area transferred remain as such.

SECTION XII.19 :- WORKING PLAN NOTE :-

The Territorial Chief Conservator of Forests in consultation with Dy. Conservator of Forests, Pusad Division shall prepare a note on Working Plan at the end of Working Plan period and the note shall be forwarded to the Conservator of Forests, Working Plans for preparation and revision of working plan of the forest division.

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CHAPTER XIII

THE ESTIMATED VALUE OF THE FORESTS

The forest of Pusad division is tropical dry, decaded forests dominated by teak (*Tectona Grandis*) distributed throughout the forest along with its natural associates like Dhawada, Ain, Lendia, Tiwas, Tendu, Behada, Salai, Bija, etc. The teak is of mostly coppice origin. There are about 101 varieties of timber species exists in this forest and all of them may not be economically profitable. An attempt has been made here to calculate the total capital value of the forest by using standard deviation method. The capital value has been calculated for various working circles as the stocking position is different in various working circles.

SECTION XIII.1 : THE ESTIMATED CAPITAL VALUE OF THE FORESTS.

XIII.1.1 The forest of Pusad Division is a tropical of dry-deciduous forests, with nearly 101 varieties of timber species, not all of them economically profitable. An attempt has been made here to calculate the total capital value of the forests by using devastation method. The capital value has been calculated for various Working Circle, since the stocking position is different is various felling series.

1) Capital value of the Selection Working Circle :- Total Area = 35709.73 Ha.

Capital Value of Forest allotted to Selection Working Circle.

TABLE NO. -69.

Sr. No.	Name of Working Circle	Girth Class	Number of Trees/Ha		Stumpage value		Capital Value Forest/Ha	
			Teak	Non-Teak	Teak	Non-Teak	Teak	Non-Teak
1	S.C.I.	15-30	48	100	90.12	27.50	4325.76	2750.00
2		31-45	52	53	605.17	178.75	31468.84	9473.75
3		46-60	40	27	1320.62	395.00	52824.8	10665.00
4		61-75	26	17	2707.05	812.50	70383.30	13812.50
5		76-90	17	12	4764.72	1430.00	81000.24	17160.00
6		91-105	8	7	8245.32	2222.75	65962.56	15559.25
7		106-120	3	5	11828.47	3547.25	35485.41	17736.25
8		121-135	1	2	13598.35	4079.82	13598.35	8159.64
9		136 & above	0	3	14848.35	4455.00	0	13365.60
	Total						355049.26	108681.99

The value per Hectare = 4,63,731.25 Rupees

Total Value = Area x Value per hectare = 35709.73 Ha.X463731.25 Rupees

= 1655,97,17,730 Rupees.

2) Capital value of the forests allotted to the Afforestation Working Circle.

Area = 12297.03 Ha.

TABLE NO. -70

Sr. No	Name of Working Circle	Girth Class	No.of Trees/Ha		Stumpage value		Capital Value Forest/Ha	
			Teak	Non-Teak	Teak	Non - Teak	Teak	Non-Teak
1	A.W.C	15-30	41	100	90.12	27.50	3694.92	2750
2		31-45	25	39	605.17	178.75	15129.25	6971.25
3		46-60	18	15	1320.62	395.00	23771.16	5925
4		61-75	11	8	2707.05	812.50	29777.55	6500
5		76-90	6	5	4764.72	1430.00	28588.32	7150
6		91-105	2	3	8245.32	2222.75	16490.64	6668.25
7		106-120	1	2	11828.47	3547.25	11828.47	7094.50
8		121-135	0	1	13598.35	4079.82	0	4079.82
9		136 & above	0	2	14848.35	4455.00	0	8910
	Total						129280.31	56048.82

The value per Hectare =185329.13 Rupees

Total Value = Area x Value per hectare = 12297.03 Ha.X185329.13 Rupees

= 2278997871.48 Rupees.

3) Capital value of the forests allotted to the Catchment Area Treatment Working Circle.

Area = 17015.00 Ha.

TABLE NO. -71.

Sr. No.	Name of Working Circle	Girth Class	No.of Trees/Ha		Stumpage value		Capital Value Forest/Ha	
			Teak	Non-Teak	Teak	Non-Teak	Teak	Non-Teak
1	C.A.T. W.C	15-30	45	134	90.12	27.50	4055.40	3685.00
2		31-45	42	46	605.17	178.75	25417.14	8222.50
3		46-60	36	28	1320.62	395.00	47542.32	11060.00
4		61-75	26	15	2707.05	812.50	70385.90	12187.00
5		76-90	17	11	4764.72	1430.00	81000.24	15730.00
6		91-105	7	6	8245.32	2222.75	57717.24	13336.50
7		106-120	2	4	11828.47	3547.25	23656.94	14189.00
8		121-135	0	2	13598.35	4079.82	0	8159.64
9		136 & above	0	2	14848.35	4455.00	0	8910.00
	Total						309775.2	95479.64

The value per Hectare = 405254.8 Rupees.

Total Value = Area x Value per hectare = 17015.00 Ha.X405254.8 Rupees.

= 6895410762 Rupees

Capital value of the forests allotted to the Silvi Pasture Working Circle. Area = 1680.90 Ha.

TABLE NO. -72.

Sr. No	Name of Working Circle	Girth Class	No.of Trees/Ha		Stumpage value		Capital Value Forest/Ha	
			Teak	Non Teak	Teak	Non Teak	Teak	Non Teak
1	F.I.W.C	15-30	45	111	90.12	27.50	4055.4	3052.5
2		31-45	26	62	605.17	178.75	15734.42	11082.5
3		46-60	17	25	1320.62	395.00	22450.54	9875
4		61-75	15	13	2707.05	812.50	40605.75	10562.5
5		76-90	8	10	4764.72	1430.00	38117.76	14300
6		91-105	3	7	8245.32	2222.75	24735.96	15559.25
7		106-120	1	2	11828.47	3547.25	11828.47	7094.5
8		121-135	0	2	13598.35	4079.82	0	8159.64
9		136 & above	0	4	14848.35	4455.00	0	17820
	Total						157528.3	97505.89

The value per Hectare = 255034.2 Rupees.

Total Value = Area x Value per hectare

= 1680.90 Ha. X 255034.2 Rupees.

= 428686970 Rupees.

TOTAL CAPITAL VALUE OF THE FOREST OF PUSAD FOREST DIVISION

Working Circle	Value of Forests
S.C.I.W.C.	16559717730
A.W.C.	2278997871
C.A.T.W.C.	6895410762
F.I.W.C.	428686970
Total	26162813334

SECTION XIII.2 :

XIII.2.1 The total forest area of Pusad Forest division is 69435.26 Ha. The capital value of the forest estimated is 2616.28 lakhs by using the standard deviation method. Without considering other intangible benefits. The Government have issued G.R.No./FLB-1002/C.No. 199/ F-10, Dt. 9/12/2003 in which the procedure is given how to calculate net present value (NPV) base on quality, density and species. In view of instructions in above mentioned G.R. an attempt has been made to calculate net present value (NPV) of Pusad forest division. The extent of area densitywise is given in the following table.

DENSITY

DENSITY	AEA IN HA.
0.6 & above	15313.09
0.4 to 0.6	27807.91
0.1 to 0.4	12429.01
0.1 & below (blank)	13885.25
E.Total	69435.26

XIII.2.2. As per the G.R. different rates are given for different density classes and different working circle. The net present value calculated is given in the below mentioned table.

TABLE NO. – 73
N.P.V. CALCULATION

W.C.	DENSITY	AREA IN Ha.	RATE in Lac.	NPV in Lac.
S.C.I.	0.6 & above	7913.27	9.20	72802.08
	0.4 to 0.6	27796.46	9.00	250168.14
Other W.C. (AWC, CAT, OTP, FIWC, MISC.)	0.6 & above	3629.03	7.70	27945.61
	0.4 to 0.6	13554.09	Av. 7.13	96640.66
	0.1 to 0.4	11521.56	Av.6.56	75581,43
	o.1 & below (blank)	5020.58	5.80	29119.36
			TOTAL	552257.28

The net present value (NPV) of forest of Pusad is Rs. 5,52,257.28 Lakhs.

SECTION XIII.3: ESTIMATED VALUE OF OUT TURN OF FOREST :

XIII.3.1 The forest of this division is being managed on a sustained annual yield basis. The net annual realisation represents the return on the capital out-turn of calculated by formula

$$\text{Capital out-turn} = \frac{R}{0.0P}$$

Where 'r' is the net annual income and 'p' is the rate of interest.

The average annual income from this division for last 10 years is Rs. @ 7 % interest the capital out-turn of this net income is.

$$\text{Capital out-turn} = R/0.0p = \frac{27663041}{0.07} = 395186300$$

The total area covered under this plan is 69435.26 ha.

$$\text{Hence capital value per ha is : } \frac{27663041}{69435.26} = \text{Rs. } 5691.43$$

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CHAPTER XIV

CONTROL AND RECORDS

SECTION XIV.1: CONTROL AND RECORDS

XIV.1 The following records will be maintained in the division office.

1. Control forms
2. Compartment History
3. Plantation and Nursery Registers
4. Divisional Note Book.

XIV.1.1 CONTROL FORMS:

- i. Control forms should be prepared to include each of working plan prescriptions as well as definite suggestions regarding other operations. For the control of all harvesting, subsidiary cultural operation, cleaning, thinning, burning, regeneration works and soil and moisture conservation works carried out as per the working plans prescription. It will be maintained in the control forms for controlling and maintaining a record of all trees. The prescribed proformas of the following forms will be given in the Volume II of the draft plan.
- ii. Three permanent sets of these control forms will be prepared. One set will be kept in the Division Office, the other set will be flying set for the use of the Conservator of Forests working plan. Third set will be kept in the Territorial Chief Conservators office. Dy. C.F. Pusad will annually make entries in the flying set and will be sent annually to Conservator of Forests working plan Yavatmal on or before December 1st and latter should send them to the Chief Conservator of Forests Yavatmal on or before January each year. All the entries showing the deviation from the prescription of working plan will be underlined in red ink. The Conservator of Forests working plan will scrutinized and will send it to the CCF (T) Yavatmal. CCF Yavatmal will be in turn send it to CCF W.P. Nagpur with his remarks not latter February 1st of following year. CCF WP Nagpur in turn will forwarded them to the APCCF (Production) for perusal and order where required.

XIV.1.2 COMPARTMENT HISTORIES

Compartment histories i.e. the record of various activities and observations made in the past year will be maintained in forms No. 1 to 5 as given in Volume II Appendix No LV of draft working plan.

1. FORM NO. 1 : Compartment description written by Conservator of Working Plan, Yavatmal as his inspection and forest proceeds.
2. FORM NO. 2: Record of changes in the growing stock and plantations.
3. FORM NO. 3: Record of operations and out turn.
4. FORM NO. 4: Record of observations.
5. FORM NO. 5: Record of injuries.

Each compartment or sub compartment must have a separate file for its each record. Compartment history must be maintained by the division since they keep the record of past management practices and their effects on the growing stock.

Every year in July the Range Forests Officer should fill in the necessary information and will send to the Deputy Conservator of Forests for scrutinizing editing through the concern ACF who after doing so will get them typed and sign them. One copy of the forms will be filed in the divisional compartment history file while one copy each will be sent to Range Forest Officer and Conservator of Forest, Working Plan in the month of August.

XIV.1.3 PLANTATION AND NURSERY REGISTERS.

Plantation register will be maintained for all thee areas regenerated artificially in the form No. 1 to 9 as given in the Volume II Appendix No. LVI.

Nursery registers will be maintained in Form No. 1 to 10 as given in the Volume II Appendix No. LVII of draft Working Plan.

XIV.1.4 DIVISIONAL NOTE BOOK.

The matter of divisional importance will be recorded under standard heading for records and ready reference in the divisional note book. A brief note on the plantation will also be recorded by the Dy. C.F. under the appropriate heads. The forms of Divisional Note Book is given in the Volume II Appendix No. LVIII.

CHAPTER XV

FINANCIAL FORECAST

SECTION : XV.1 : WHY FINANCIAL FORECAST

Working plan for the Pusad has been prepared with specific objectives in respective working circles. Various prescriptions have been given to achieve these objectives. Execution of works needs proper planning and adequate financial provision for that. Execution of works will generate some services and revenue to exchequer. That is why we need financial forecast for the plan.

SECTION : XV.2 : EXPENDITURE

XV.2.1: EXPENDITURE ON ESTABLISHMENT :

To run the proper administration, an efficient administrative set up is required. It is recurring expenditure on the set up of organization i.e. on salary and other benefits to officials and staff. Maintenance of offices vehicles, roads, buildings, machines, communications and other paraphernalia.

XV.2.2: EXPENDITURE ON EXPLOITATION OF FOREST PRODUCES: During the implementation of prescriptions of the draft report, some forest produces are going to be harvested. In selection cum improvement working circle. Teak plantation working circle, to some extent in protection working circle and non wood forest produce (overlapping) working circle, forest produces in the form of timber, firewood, or other produces like tendu leaves etc will be certainly harvested, It will need expenditure to be incurred on various activities.

XV.2.3: EXPENDITURE ON REGENERATION ACTIVITIES:

Main objective of this plan report is to have sustainable development of forests. Which ultimately requires regeneration of forests either naturally or artificially. Regeneration activities will can not be executed without spending expenditure and services..

XV.2.4: EXPENDITURE ON CONTROLLING ACTIVITIES:

Draft plan report envisages to have controlling activities to achieve its objectives. Such as fire and grazing control need constant controlling activities and expenditures.

XV .2.5: EXPENDITURE ON SOIL AND MOISTURE CONSERVATION:

Soil and moisture conservation measures will require expenditures to be incurred for their executions.

XV.2.6: EXPENDITURE ON WILDLIFE PROTECION, ECOTOURISM AND CONSERVATIONS:

Protection of wildlife in both forms faunal and floral and their conservation and practicing ecotourism certainly leads to incurring of expenditures.

XV .2.7: EXPENDITURE DETAILS:-

Since the expenditure on various items are linked with minimum wage rate for wages and the prevailing salaries of staffs and officers in a dynamic linkage with market rate and dearness to the point of time. It is not possible to work out the expenditure on specific item at a point of time. We can have the glimpses of it based on certain assumptions. First of all we assume that wage rate and salaries and other commodities consumption are going to be static. The quantum of works to be carried out also going to be constant and furthermore the areas to be tackled yearly are also not going to vary. Based on these assumptions, the calculations are made. These are symbolic and not final.

(a) **TIMBER:** Cost of exploitation per cubic meter timber = Rs. 1100/-

Cost of exploitation per beat firewood = Rs. 300/-

TABLE NO. - 74

Sr. No	Working Circles	Area in ha.	Area/ year in ha.	Yield		Expenditure in Rupees in lac.	
				Timber	Fire wood	Timber, Firewood	Total
1	2	3	4	5	6	7	8
1	SCIWC	36392.34	1819.62	5331.00	1600.00	64.00	77.00
2	AWC	12434.23	621.71	909.00	900.00	13.00	
				6241.00	2500.00	77.00	77.00

Yield calculation has been done in respective working cycles.

(b) REGENERATION:-

(i) NATURAL REGENERATION :

Natural regeneration will be carried out in selection cum improvement, Afforestation working circle, Catchment working circle and Silvi Pasture working circle.

TABLE NO. - 75

Sr. No.	Working Circles	Area in ha.	Area/ year in ha.	Expenditure (Rupees in lacd (Rate @ 5 man days/ ha & @ 72/- per daily wage)	No. of Mandays to be generated.
1	2	3	4	5	6
1	SCIWC	36392.34	1819.62	6.55	9097
2	AWC	12434.23	621.71	2.24	3111
3	CATWC	17252.00	862.60	3.10	4305
4	FIWC	1688.90	168.89	0.61	847

(ii) ARTIFICIAL REGENERATION:

Artificial regeneration works are required in Old Teak Plantations. The expenditure will incurred as per the rate sanctioned by the office of PCCF MS.

TABLE NO. - 76

Sr No	Plantati on work	Area in ha.	Area/ year in ha.	Oper-ation	Expenditure in Rupees in lacs Rate of exp. @ 10000/ha and @ 72/- per daily wage.	No. of Mandays to be generated.
1	2	3	4	5	6	7
1	Teak	4000	200	PPO/PYO	13.00	18055
	Plantat			FYO	20.00	27777
	ion			SYO	13.00	18055
				TYO	9.00	12500
				4 TH YO	7.00	9722
				5 TH YO	5.00	6944
				Total	67.00	93053

(c) SOIL AND MOISTURE AND OTHER ITEMS:-

Exhaustive plan will be prepared and expenditure will be procured from Employment Guarantee Schemes and Rural Development Schemes and Water Conservation Schemes of Central and State Department. Hence no quantification has been attempted.

14.2.2.1:- YEAR WISE DETAILS OF EXPENDITURE: Expenditure to be incurred during plan period summarized in following table.

TABLE NO. -77

Y E A	Establishment	Boundary, fire, grazing etc. control	Timber	S&M works	NR	Artificial Regeneration						Total	No of Mandays to be generated
						PPO	FYO	SYO	T Y O	4 TH YO	5 TH YO		
1	2	3	4	5	6	7	8	9	10	11	12	13	14
2008-09	286	45	77	6	13	13	0	0	0	0	0	440	213891
2009-10	286	45	77	6	13	13	20	0	0	0	0	465	248611
20010-11	286	45	77	6	13	13	20	13	0	0	0	478	266666
2011-12	286	45	77	6	13	13	20	13	9	0	0	487	279166
2012-13	286	45	77	6	13	13	20	13	9	7	0	494	288888
2013-14	286	45	77	6	13	13	20	13	9	7	5	499	295833
2014-15	286	45	77	6	13	13	20	13	9	7	5	499	295833
2015-16	286	45	77	6	13	13	20	13	9	7	5	499	295833
2016-17	286	45	77	6	13	13	20	13	9	7	5	499	295833
2017-18	286	45	77	6	13	13	20	13	9	7	5	499	295833

SECTION: XV..3: ANNUAL REVENUE EXPECTED FROM ALL SOURCES:

XV.3.1. REVENUE FROM EXPLOITATION OF FOREST PRODUCES:

Exploitation of forest produces not only leads to incurring expenditure but also generates revenue in the forms services and goods. Revenue is going to be received from exploitation of timber, firewood, bamboo, tendu leaves, services of grazing, ecotourism, minor forest produces etc.

XV.3.2: REVENUE FROM ALL SOURCES:**TABLE NO. - 78**

Sr. No	Item	Quality	Rate	Revenue in lakh.
1	2	3	4	5
1	Timber	6240	13000/Cmt	811.00
2	Fuel Beats	2500	2500/beat	63.00
3	Pole	10000	150/pole	15.00
4	Tendu	11300 S.B.	Lump-sum	26.00
5	Miscellaneous		Lump-sum	4.00
	Total			919

XV .3.2.1:- STATEMENT OF REVENUE AND EXPENDITURE FOR THE ENTIRE PLAN PERIOD: (In Rupees in lakh)**TABLE NO. - 79**

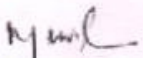
Sr. No	Year	Tim ber	Fuel Beat	Pol e	Tendu	Ot her	Total Revenue	Total Expendi ture	No of Mandays to be generated
1	2008-09	811	63	15	26	4	919	440	213891
2	2009-10	811	63	15	26	4	919	465	248611
3	2010-11	811	63	15	26	4	919	478	266666
4	2011-12	811	63	15	26	4	919	487	279166
5	2012-13	811	63	15	26	4	919	494	288888
6	2013-14	811	63	15	26	4	919	499	295833
7	2014-15	811	63	15	26	4	919	499	295833
8	2015-16	811	63	15	26	4	919	499	295833
9	2016-17	811	63	15	26	4	919	499	295833
10	2017-18	811	63	15	26	4	919	499	295833

SECTION: XV.4: EXPENDITURE ON PLAN PREPARATION:

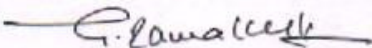
Expenditure on plan of Pusad Forest Division cannot be separately worked out. Working Plan Division has been given the responsibility of preparing of various forest divisions. Revision of Working plan for Pusad Forest Division was taken during 2003-04 and simultaneously, Revision of Central Chanda Forest Division as well as Akola Forest Division had been conducted since then. Office of the Conservator of Forests working plan Nagpur also incurs expenditure on GIS works and instruments. Hence actual expenditure on preparation of this plan cannot be segregated. Proportionate expenditure has been worked out.

Proportionate Expenditure	Rs. 2850000.
Working Plan Area.	69435.26 ha.
Per Unit Area Cost.	41.04/ha.

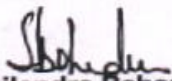
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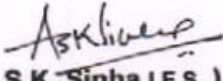

(V.V.Gurme I.F.S.)
Deputy Conservator of Forests
Pusad Forest Division
Pusad


(Dr.Harshdeep Kamble)
Collector, Yavatmal


(G.R.K.Rao I.F.S.)
Conservator of Forests
Working Plan
Yavatmal

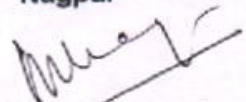

(Ramanuj Choudhary I.F.S.)
Chief Conservator of Forests
Working Plan
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(Shailendra Bahadur I.F.S.)
Chief Conservator of Forests(Territorial)
Yavatmal


(A.S.K. Sinha I.F.S.)
C. C. F. (Conservation)
Nagpur

(R.R.Sahai I.F.S.)
Chief Conservator of Forests
(Policy, Technology and S.P.)
Nagpur

(C.S.Joshi I.F.S.)
Addl. P.C.C.F., (H.R.D. & Admn.),
Nagpur

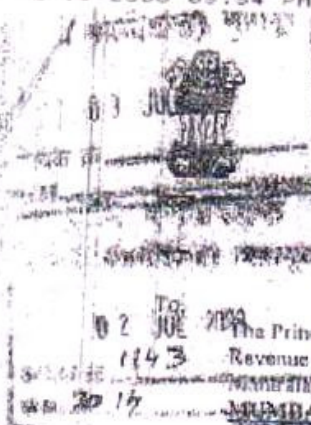

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भारत सरकार
GOVERNMENT OF INDIA
पर्यावरण एवं वन मंत्रालय
MINISTRY OF ENVIRONMENT & FOREST

वर्क प्लान प्रस्ताव (FOR) 1527

To: The Principal Secretary,
Revenue and Forest Department,
MURBADA

क्षेत्रीय कार्यालय, पश्चिमी क्षेत्र
Regional Office, Western Region

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बोयल (नं०१०)/Bhopal-462016 (M.P.)

ईमेल/E-mail: rcefbhopal@gmail.com

Dt- 18-06-2008

Sub: Working Plan proposal for Pusad Forest Division, written by Dr. D.K. Tyagi and Shri G.R.K. Rao for the period of 2007-08 to 2016-17.

- Ref: 1. Revenue and Forests Deptt., Government of Maharashtra letter No. FDM 2007/C.R. 229/F-3, dated 14 August, 2007.
2. PCCF, Govt. of Maharashtra letter No. D-14/WP/CR.363/204/2007-08, dated 25.09.2007, 3.12.2007 and 20.5.2008.

Sir,

With reference to the above mentioned subject, I am directed to say that after careful examination of the Working Plan of Pusad Forest Division, the Central Government hereby conveys its approval to the said working plan in accordance with the powers vested under Forest (Conservation) Act, 1980 subject to following conditions:-

- (1) The currency of the Working Plan shall be for a period of 10 years i.e. from 2008-09 to 2017-18.
- (2) The prescription of "overwood removal" in the forest areas allocated to Selection-cum-Improvement Working Circle" shall be dropped.
- (3) The entire area proposed for "Teak Plantation Working Circle" shall be incorporated in "Selection-cum-Improvement Working Circle".
- (4) The orders of Hon'ble Supreme Court in the matter of Godaverman Thernalkpad Vs Union of India in W.P. (Civil) No. 202/95 and related Inter Locutory applications shall be strictly adhered to. Any prescription or operation at variance with the Hon'ble Supreme Court's order shall be kept in abeyance till the order is in force or otherwise modified.
- (5) Further, in compliance with orders of Hon'ble Supreme Court's dated 23.05.2000, the state government of Maharashtra shall ensure that regeneration of forests is commensurate with fellings carried out under this working plan.
- (6) No felling shall be carried out without allocating necessary fund for implementation of regeneration operation so as to make regeneration commensurate with fellings. In the event of failure in regeneration or any shortfall in carrying out regeneration operation, no further felling shall be undertaken until the failure/shortfall is made up.

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316/08
पुसद वनक्षेत्र
(कार्य-उपक्षेत्र)
30-6-08

- (7) Following the directions of the Hon'ble Apex Court in their order dated 22.09.2000, a Core Group has been constituted under the Chairmanship of the Director General of Forests and Special Secretary for deciding the extent of harvesting that could be permitted under approved working plans for ensuring regeneration to be commensurate with felling. Instruction/directions of the Central Government in the matter to be issued in future shall be strictly complied with. Felling to be done by State Government only after seeking permission from Core Group constituted by the MOEF, New Delhi.
- (8) No forests bearing naturally grown trees shall be clear felled for any purpose whatsoever.
- (9) Prescriptions of microplans for JFM (if made) should not deviate the broad framework/guidelines of the working plan and shall be in accordance with various orders of Hon'ble Supreme Court.
- (10) Felling carried out on forest land after seeking approval of the Central Government under Forest (Conservation) Act, 1980 will not be treated as deviation. However, proposed felling in the forest division shall be restricted proportionately in the current/following years to compensate this removal.
- (11) No deviations shall be made from the prescriptions of working plan read with the conditions stipulated herein without prior approval by the Central Government under Forest (Conservation) Act, 1980. However, deviations of positive nature i.e. out of turn plantations carried out outside the worked area under any project schemes and compensatory afforestation may be approved by the competent authority of the State Government.
- (12) The Central Government reserves the right to review, modify, withdraw this approval at any time if any of the conditions of approval are not implemented or relevant modification in the working plan is required so as to keep it in conformity with the orders, circulars and guidelines issued by the Central Government or the Apex Court under Forest (Conservation) Act, 1980 or any other statute and National Forest Policy.

Yours faithfully,

(Pradeep Vasudeva)
Deputy Conservator of Forests (Central)

Copy to:

1. The Additional Director General of Forests (FC), Ministry of Environment and Forests, Paryavaran Bhawan, CGO Complex, Lodi Road, New Delhi - 110 003.
2. The Principal Chief Conservator of Forests, Govt. of Maharashtra, Seminary Hills, Nagpur.
3. The Chief Conservator of Forests (Working Plan), Government of Maharashtra, Nagpur.

(Pradeep Vasudeva)
Deputy Conservator of Forests (Central)