



Government of Maharashtra

**Working Plan for
Gondia Forest Division
(Nagpur Circle)**

Volume – I

Period

**2023-24 to 2032-33
(As per WPC-2014)**

Original plan (2013-14 to 2022-23) By Shri. T.K. Choubey, IFS

By

Shri. Amit Kumar Mishra, IFS

and

Smt. Geeta Nannaware, IFS

**Office of the Dy. Conservator of Forests (Working Plan)
Zero Mile, Civil Lines, Nagpur**

PREFACE

The previous Working Plan for the Gondia Forest Division was prepared for the period 2013-14 to 2022-23 and was approved for a duration of ten years. The said plan expired on 31.03.2023. As per the provisions of the Working Plan Code, 2014, the plan was due for revision, and accordingly, the Preliminary Working Plan Report (PWPR) was presented before the Standing Consultative Committee (SCC) and approved. The SCC also issued certain recommendations, which have been duly complied with.

During the SCC meeting, it was decided that since the earlier plan was prepared for a 20-year management period, the plan should be extended and approved for the remaining 10 years. In line with this decision, the Draft Working Plan Report (DWPR) for Gondia Forest Division was submitted to the SCC on 05.02.2025 where coupe no. XI treated as coupe no. I and sequence to be followed.

One of the key points discussed during the meeting was the verification of unclassed forest areas currently in possession of the Forest Department, as well as reconciling the total forest area mentioned in the working plan. A detailed analysis of this matter has been carried out and incorporated as Chapter 14 of the report. For compliances related to the Survey and Demarcation, new Chapter 13 is added. A list of identified forest areas has also been annexed as Appendix LV in volume II.

The final approval of the Working Plan was accorded vide letter No. F.N0.:12-56/98(FOR)/14290, dated 29.05.2025, subject to certain compliances. These have been fulfilled and can be found as Appendix no. LVI, LVII, X, XV, XVI, XVII of the updated Working Plan.

Except for the above-mentioned revisions and additions, all other prescriptions related to management practices, working circle formation, and overlapping working circles remain unchanged from the previous Working Plan.

Date :
Place:

(Smt. Geeta Nannaware)
Deputy Conservator of Forests
Working Plan, Nagpur

ACKNOWLEDGEMENTS

The successful extension of the Working Plan for Gondia Forest Division has only been possible due to the dedication and support of numerous individuals and institutions.

Firstly, I express my deep gratitude to Shri. M. Srinivasa Rao, ex PCCF (Production and Management), and Shri. Vivek Khandekar ex PCCF (Production and Management), and Shri. Sanjeev Gaur, PCCF (Production and Management), whose guidance and timely inputs at various stages were instrumental in shaping the direction of this plan. I am also sincerely thankful for the valuable contributions of PCCF (HoFF) Smt. Shomita Biswas and other senior officers, whose remarks and observations during various Standing Consultative Committee (SCC) meetings significantly enhanced the quality and substance of the plan.

I am especially grateful to all esteemed members of the SCC, Smt. Shomita Biswas, PCCF (HoFF) and Chairman of SCC, Shri. M. Srinivasa Rao, PCCF (P & M), Dr. S. Senthil Kumar, DDGF, IRO Nagpur, Shri. Vivek Khandekar, APCCF (Wildlife), Shri. P. Kalyan Kumar, APCCF (BPD) and Shri. B.N. Naik, Assistant Director, FSI, Nagpur whose thoughtful suggestions and critical insights helped refine and improve the plan further.

My sincere thanks are also to CF, Nagpur, Smt. A. Sree Lakshmi, for her consistent support, timely availability of reference documents, and guidance throughout the preparation stages. My sincere thanks to Dr. Sivabala. S., CF, Working Plan-East, Nagpur for his constant guidance and support.

I am very much thankful to Shri. Amit Kumar Mishra then DCF, Working Plan, Nagpur for herculean work of working plan updation.

I also extend my heartfelt appreciation to DCF Gondia and DCF Bhandara, whose collaboration was particularly valuable in carrying out the verification exercise of unclassed forest areas.

This exercise would not have been possible without the unwavering support of my core team members ACF Smt. Puja Joshi, whose meticulous efforts and attention to detail were vital in the completion and revision of the plan.

I would like to place on record my deep appreciation for our hardworking and committed RFO Smt. Shubhangi Mohite and Shri. Bharat Koli, Shri. Datta Bhargave, Shri. Harihar Nasre, Ranger Surveyor, Shri. Kishor Kohad, Surveyor and Shri. Sarfaroj

Sheikh, Surveyor who undertook the challenging task of preparing the area statement with exceptional diligence. Their availability and responsiveness at every step made a significant difference.

Lastly, I would like to thank every member of the staff, both in the field and at the office (especially our clerical staff and peon), who directly or indirectly contributed to the successful completion of this Working Plan.

Date :

Place:

(Smt. Geeta Nannaware)
Deputy Conservator of Forest
Working Plan, Nagpur

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WORKING PLAN OF GONDIA FOREST DIVISION

EXECUTIVE SUMMARY

Gondia district was established on 1st May 1999 after the separation from Bhandara district. Gondia district was under the privilege of 'Gond Raja'. The whole area was surrounded by the dense forest. 'Gond ' is the main tribe of this area. According to the book written by Mr. R.V. Russel, the main business of the local people was collection and selling of Gum and Lac on which the district takes its name as Gondia.

Gondia district lies entirely within the Wainganga basin. Three major tributaries of the Wainganga are the Bagh, the Bawanthadi and the Chulband drain in the district. The district is traversed West to East in the middle by the Nagpur-Calcutta (South-Eastern) broad gauge railway line and the Nagpur-Raipur National Highway. The district of Gondia is often called “Lake District” of Maharashtra, which is well justified by the fact that there are 3 major irrigation projects, 18 medium project and many minor tanks and village tanks.

Maintenance/ increase in the extent of forest and tree cover

This working plan deals with reserve forest, protected forest, unclassified forest & zudpi jungle of Gondia forest division in Maharashtra. The total Forest area as per old plan is 1731.78 sq.km. Out of this 44.22 sq.km is handed over to Bhandara forest division. Hence the total Forest area of the division excluding FDCM, Nawegaon and Nagzira Tiger Reserve extends over to 1688.89 Sq. Km.

Administrative Units: For administrative convenience the ranges, rounds and beats were reorganized in Gondia Dn. and the entire division has been divided into 12 ranges, 62 rounds and 294 beats.

Range wise area Statement of Gondia Forest Division

S.N	Name of Range	(RF, NRF, PF, Gose PF, Zudpi Jungle & Unclassed Forest)					Non Forest land received as Compensation under FCA Area in ha.	Total Area in ha.
		RF	PF	Grand Total (RF+PF) 3+4	Zudpi Jungle	Unclassed Forest Area in ha.		
		Area in ha.	Area in ha.	Area in ha.	Area in ha.			
1	2	3	4	5	6	7	8	9
1	Tiroda	2363.570	3442.387	5805.957	2147.500	0.000	0.000	7953.457
2	Gondia	1267.571	4978.296	6245.867	3338.920	130.500	0.000	9715.287
3	Goregaon	1947.033	7002.587	8949.620	1584.560	2319.499	2.610	12856.289

S.N	Name of Range	(RF, NRF, PF, Gose PF, Zudpi Jungle & Unclassed Forest)					Non Forest land received as Compensation under FCA Area in ha.	Total Area in ha.
		RF	PF	Grand Total (RF+PF) 3+4	Zudpi Jungle	Unclassed Forest Area in ha.		
		Area in ha.	Area in ha.	Area in ha.	Area in ha.			
1	2	3	4	5	6	7	8	9
4	Amgaon	579.100	3038.594	3617.694	2520.860	127.592	0.000	6266.146
5	Salekasa	4206.770	5431.421	9638.191	4691.250	1069.603	8.140	15407.184
6	North Deori	5322.900	8449.016	13771.916	6.060	1011.047	4.980	14794.003
7	South Deori	5085.400	6655.691	11741.091	378.740	0.000	9.420	12129.251
8	Chichgarh	12412.290	10253.22	22665.51	801.800	53.454	0.000	23520.761
9	Sadak Arjuni	7114.862	8764.843	15879.705	1773.350	964.453	0.000	18617.508
10	Nawegaon bandh	10611.907	4832.17	15464.077	1014.500	182.551	0.000	16661.128
11	Gothangaon	11118.100	3752.401	14870.501	1228.740	1381.879	0.000	17481.120
12	Arjuni Morgaon	8447.650	4649.96	13097.61	389.400	0.000	0.000	13487.012
Grand Total		70477.153	71270.585	141747.739	19875.680	7240.578	25.150	168889.146

Land Use, Land Use Change and Forestry (LULUCF)

The total geographical area of the district is 5234 Sq.km. The condition of the forests and forest cover over the last decade during the implementation of the plan based on India State of Forest Report is as follows.

ISFR Year	Geographical area (Sq. Km)	VDF	MDF	OF	Total	% of Geographical area	Scrub	Change w.r.t previous report
2017	5234	892	733	298	1923	36.74	30	-5
2019	5234	888.61	732.23	717.75	1938.92	37.04	32.25	15.59
2021	5234	895.40	739.26	310.95	1945.61	37.17	27.18	7.02
2023	5234	962.58	662.20	279.03	1903.81	36.37	22.94	3.40

The forests of Gondia Division belong to the sub group 5A “Southern Tropical Dry Deciduous Forests”, as per the revised classification of forest types of India by Champion and Seth. Depending mainly upon the topography, edaphic factors and past treatments given to the area, composition of the crop varies considerably. Local variations in the altitude do not influence the distribution of various species.

Trees Outside Forests (TOF)

The Trees Outside Forests (TOF) / Plantation for State of Maharashtra, according to the India State of Forest Report 2023, is 14747.60 sq. km. This area adds 4.79% to the tree cover of the State. However, no specific figure for the Gondia District is available.

Status of Biodiversity Conservation in forests

The forests of Gondia division belong to miscellaneous forest and few compact forest blocks of Saleksa, Gothangaon and Nawegaon bandh ranges are rich in Biodiversity and these areas are overlapping with the Nagzira Wildlife Sanctuary and the Nawegaon National Park. As a part of in-situ conservation these Wildlife Sanctuary and National Park were set up.

In the recent years the awareness regarding conservation of flora and fauna among the local community and in people residing in the forest has helped in a large extent in protecting the forest of this area. These communities have a vast knowledge about local flora and fauna which is very important for biodiversity conservation. The Forest Department with the help of local communities have set up Biodiversity Management Committees (BMC) in 545 Gram Panchayat in order to record the indigenous knowledge systems existing among the local community to have access sharing benefits for the active conservation efforts made by the forest dependent communities.

Conservation and Maintenance of Soil and Water Resource

The exact area treated under soil conservation cannot be assessed as no special work for soil conservation alone is carried out but SMC works form part of the plantations works. In the Division, plantations are taken up every year and can safely be presumed that this area is treated for soil conservation. However, in the last two years, in view of the Jalayukta Shivar project, large areas have being treated specifically for soil and water conservation.

Optimization of Forest Resource Utilization

During the previous plan period from 2013-14 to 2022-23 the division has harvested coupe annually as per prescriptions mentioned in the plan.

Forest Resource Accounting

The forests of Gondia come under the Eco Class III and the value attached to this Class area as given below as per the canopy density. The average value of the forests stands at Rs. 1181160 per Ha. and varies with the type of forest and its attributes. Below is given the value of the forests of Gondia as per the current and proposed NPV value which takes into account the tangible and some components of the intangible benefits. The value of the forests

of Gondia comes to Rs. 238.73 billions as per the current NPV rates which has taken into account all the ecosystem services and functions of the forests.

Forest Carbon Stock of Tropical Dry Deciduous Forests in Gondia:

The Forests of Gondia Division mainly falls in Tropical Dry Deciduous Forests. On the basis of data from FSI Carbon stock assessment for Tropical Dry Deciduous Forests the carbon stock is estimated.

As per India State of Forest Report (ISFR), 2023 carbon stock of Gondia district is estimated as 18231.36 (in 000 tonnes).

Maintenance and Enhancement of Social, Economic, Cultural and Spiritual Benefits

State’s JFM is guided by the Govt. of Maharashtra Resolution dated 16th March 1992, 5th October 2011 and 10th July 2012. The number of villages adjoining to forests is 770. Out of 770 villages, 364 villages are covered under JFMC. The total number of members in the Committee are minimum 12 and a maximum of 24 and one-third of the members are to be from the Gram Panchayat. 50% of the members should be women and 2 members should be from SC/ST and OBC. The performance of the Committee in the Division has been satisfactory. The Forest Development Agency is well established and it’s working is satisfactory. Efforts to make the functioning and transaction of funds more and more transparent are going on in the FDA.

Status of Implementation of FRA 2006 in Gondia Forest Division:

Under Section 3(1) of FRA, 45738.762 ha area has been recognised for rights. The status of Implementation of FRA 2006 in Gondia Forest Division (till 2022-23) is given below. This recognition of rights on forest land to the traditional forest dwellers has further fragmented the area of the Division.

Sr. No.	Type of Claim	No. of Cases	Recognition of Rights Area (in Ha)
1	Individual Rights	9342	5214.88
2	Community Rights	869	40523.88
	Total	10211	45738.76

Adequacy of Policy, Legal and Institutional Framework:

The existing policy and laws in the country and the State are invoked for the management of the forests of the Division. The National Forest Policy of 1988 is the basic guide for the management strategy of this Plan. The Indian Forest Act 1927 and its Amendment is the Principal Law governing the administration of the forests in the Division.

Past Systems of Management:

Gondia district was formed in 1999. Before that, the Western and Southern parts of the district were parts of the Nagpur territory and the Northern and Eastern parts were parts of Waingangā with its headquarter at Lanji. In 1867, the Lanji and Hatta traps were transferred from Gondia district to newly formed Balaghat district. Prior to 1853, it was ruled by Marathas except for a brief period from 1818 to 1830, when it was a British protectorate. It came under the British control in 1853.

After coming under British administration in 1853 the Govt. of India issued a proclamation to make a 20 years settlement and conferred Zamindari rights on such persons who held long possession of land or were cultivating the same; and who could pay regularly the government demand on them. As a result of this proclamation, proprietary rights were conferred on the revenue farmers, village Patels and Malguzars. After the enactment of the Indian Forest Act, 1878, a major chunk of forestland in possession of Malguzars and Zamindars was declared as Reserve Forest.

Period of Regular Working under Different Working Plans: During last period the forest areas were surveyed and the forest officers tried to introduce the modern scientific management systems for these forests. In the process Working Plans were prepared with suitable prescriptions for the forest lands. Various working plans and their periods are given in the following table:

Sr.No.	Working Plans in Chronological Order	Plan-Period
1	Range-wise Plan	1893-1910
2	Best's Working Plan	1910-1930
3	Chadha's Working Plan	1930-1940
4	Jagdamba Prasad's Working Plan	1940-1957
5	Trivedi's Working Plan	1957-1977
6	Patil & Sardar's Working Plan	1977-1996
7	Shri. Vinay Kumar Sinha, Arakkal Ashraf & Shri. Jarnal Singh Working Plan	1996-97 to 2005-06
8	Shri. T.K. Choubey Working Plan	2013-14 to 2022-23

For the scientific management of forests, a compartment has been used as a unit for distribution. The allocation of compartments is based on preponderance of suitability to specific working circle. In all 5 (five) area-specific and 4(four) overlapping, working circles are prescribed.

Forest area under different Working Circle

Working Circle	Reserved Forests (Ha)	Protected Forests (Ha)	Unclassed Forests (Ha)	Zudpi Jungle (Ha)	Non Forest land received as compensation under FCA (Ha)	Total Area (Ha)	% of area under different WC	Area handed over to Bhandara Forest Division during the previous Plan period (Ha)
SCI WC	38236.929	23016.182	1308.857	0.000	0.000	62561.968	37.043	834.47
IWC	13226.020	8971.451	450.658	0.000	0.000	22648.129	13.410	2757.93
AFF WC	4170.154	28130.962	1777.577	0.000	0.000	34078.693	20.178	384.86
Protection WC	7710.117	3608.511	0.000	0.000	0.000	11318.628	6.702	445.15
MISC WC	7133.933	7543.479	3703.486	19875.680	25.150	38281.728	22.667	0.000
Total Area	70477.153	71270.585	7240.578	19875.680	25.150	168889.146	100.000	4422.41
Overlapping Working Circles								
Wildlife (OL) WC					Entire Area			
Bamboo (OL) WC					33371.918 Ha			
NTFP (OL) WC					Entire Area			
JFM (OL) WC					55037.56 Ha.			

Note: Out of Unclassed Forest and Zudpi Jungle area, section 4 of IFA, 1927 not yet applied for 7405.75 ha. Also for 25.15 ha. land received as compensatory afforestation notified under section 4 of IFA 1927, by notification no. FLD-35/2021/C.R. 653/F-3, dated 15/02/2022.

Selection-cum Improvement Working Circle

The areas capable of producing large timber, poles and firewood with less biotic pressure are allotted to this working circle. The aim is to gradually convert the areas into High Forests by encouraging natural regeneration supplemented by artificial regeneration. It includes areas which support straight pole and sound trees of both seedling and coppice origin. It includes 62561.968 ha of total areas comprising of 38236.929 Ha of Reserved Forests and 23016.182 Ha of Protected Forests & Unclassed Forests is 1308.857 ha. It constitutes an area of 37.043 % of the total forest area of the division.

Improvement Working Circle

Forest areas capable of producing medium to large-sized timber, poles and fuel wood but not considered fit for harvesting due to preponderance of young crop has been included in this working circle. The Improvement Working Circle (IWC) covers an area of 22648.129 Ha, comprising 13226.020 Ha of Reserved Forests and 8971.451 Ha of Protected Forests & unclassified is 450.658 ha. It constitutes 13.410 % of the total forest area of the division.

Afforestation Working Circle

The open forest areas having density less than 0.4 and with rootstock and shrubby growth as well as open forests without rootstock, where artificial regeneration appears necessary to restore productivity, are included in this working circle. Most of these areas are located in the immediate vicinity of the villages and are under very heavy pressure of grazing, which is the main reason for their deterioration.

The Afforestation Working Circle (AWC) forms about 20.178 % of the forest areas of the division. It includes 34078.693 Ha. of the forest areas comprising of Reserved Forests to the extent of 4170.154 Ha., Protected Forests 28130.962 Ha, and Unclassed Forest 1777.577 Ha. It constitutes 20.178 % of the total forest area of the division.

Protection Working Circle

Gondia district is known for its major and minor water tanks. The catchment areas of most of these water bodies lie in the forest. To protect these water bodies, their catchments need to be protected with good quality vegetation on it. The majority of the areas, included in this WC, have a submergence of more than 10 Ha and catchments of more than 200 Ha. It includes various irrigation projects of Gondia Division, besides some small water bodies inside the forest have also been included in this Working Circle. It extends over to 11318.628 Ha of forest areas, comprising 7710.117 Ha of the Reserved Forests and 3608.511 Ha of the Protected Forests. Out of this, 1113.37 Ha of forest land is submerged under different irrigation projects. The rest of the area 10205.258 Ha is covered with dense forest. PWC working circle area forms 6.70% of the total Forest area of the division.

Protection and soil conservation treatments in these forests is necessary for site protection, preservation of the steep and precipitous slopes and reduction of silt load to the major dams or water bodies.

Miscellaneous Working Circle

The areas included in this working circle are mainly those forest lands which are highly degraded and incapable of even producing small timber and fire wood. These areas are located in the immediate vicinity of the villages and have very heavy demand of grazing which is the main cause of their degradation. Some small patches of forests, which cannot be taken up for regular forestry working and have been excluded from the previous working circles, have also been included here. These areas are spread-over in all the ranges. The total area included in this working circle is 38281.728 Ha comprising 7133.933 Ha of Reserved Forests and 7543.479 Ha of Protected Forests Zudpi Jungle 19875.680 ha, Non Forest land

received as compensation under FCA area 25.15 ha & unclassed Forest 3703.486 It is extending over an area of 22.667 % of the total forests area of the division.

Wildlife (Overlapping) Working Circle

The location of Gondia Division's Forest is very important from the Wildlife Management point of view and the said areas have already been included in the proposed Tiger Habitat and corridor management. These forests are important for corridor management between the Protected Areas like Tadoba, Nawegaon, Nagzira, Kanha, Pench (MP) and Pench of Maharashtra, as it provides the continuity of forests among these P.As. Out of these six protected areas, four are Project Tiger areas. The adjoining PAs, like Nawegaon and Nagzira, provides an additional space for wild animals. Under the present circumstances when most of the PAs are facing the problem of management of corridor, the forests of Gondia Division can provide the solution to this problem, if managed properly with a futuristic approach.

Bamboo (Overlapping) Working Circle

This working circle includes all the areas where Bamboo is present in workable quantity, natural or planted. Workable means that there are sufficient Bamboo clumps which require independent working. This includes areas of SCI as well as Improvement working circles. The total area of the working circle is 33371.918 Ha and is spread over 145 Compartments in all the ranges except Amgaon range. Actual area under Bamboo is 727.00 Ha.

To meet the requirement of the local people as Bamboo has a significant place in local economy. Local tribal and non-tribal families use Bamboo for construction, fencing and for making variety of implements.

Bamboo has a great potential as an alternative to the timber and supports handicraft artisans called Burads for their livelihood. It has significant value for interior decoration, furniture making and manufacture of other articles of domestic use. Hence, increasing the Bamboo productivity, in the division, is very important for the development of local inhabitants of this region.

Joint Forest Management (Overlapping) Working Circle

In the past, local communities enjoyed free access to the forests. With the bringing of forests under Government control and consequent, reservation of forests permitting only specified usufructuary concessions, local communities were denied access to forest resources. Forest reservation policy came in conflict with the interest of local communities dependent on

these forests to meet their basic needs of forest products. The forests were managed as govt. property in larger national interest as provided for in the National Forest Policy 1952 which stated that the use of forests by village communities in their neighbourhood should in no event be permitted at the cost of national interest. Such policy of managing forest only in larger national interests, overlooking the basic needs of local communities did not succeed and forests were degraded as a result of over use. Forest Department could not effectively protect the forests whose degradation continued.

Forest conservation necessitated active participation of local communities. The National Forest Policy, 1988 accordingly provided for creating a massive people who suffer the most as a result of forest degradation.

This Overlapping Working Circle extends to the entire area of the Gondia forest Division which is co-terminus with the area of Gondia District. Villages that are adjoining to the forest areas are the local areas for practicing Joint Forest Management. There are total 364 JFM committees having total forest land of 55037.566 ha. in Gondia Forest Division.

Management of the Spiritual, Cultural Aspect of Forests and Ecotourism

Gondia Forest Division has its varied flora and fauna ranging from the grasslands, the wetland to the thick forests and has quite few ecotourism sites of potential. They are not properly developed and require immediate attention.

The social aspect of forests in the context of ecotourism is very important as it provides the people with employment. The other important social contribution of ecotourism is the exposure to the other cultures and the chance to educate others about one's own culture. It is generally observed that small projects in JFM villages and ecotourism sites not only provides employment to the youths but also gives a boost to their self-confidence.

The eco-sites identified also have lot of spiritual significance and religious sentiments attached to them.

Constraints Faced During Writing of the Plan

PWPR of Gondia Forest Division sanctioned by standing consultative committee on 26/03/2021. DWPR should be prepared till March 2023. But information required for preparation of DWPR was the main constraint. Another constraint was the working plan officers were in the additional charge. From 2021 to 2025, 5 DyCF worked as a working plan officer. Midterm transfer of WPO was also the major constraint, due to which submission of

DWPR was not possible within time limit. Enumeration data was not available for the period as stock mapping was not carried out for the plan period.

I. INTRODUCTION

MISSION STATEMENT OF MAHARASHTRA FOREST DEPARTMENT

Globally as well as nationally, Forest Conservation is increasingly being viewed as a powerful instrument in sequestering carbon and thereby offset adverse climate change. Maharashtra Forest Department, being custodian of the State's rich and diverse bio-diversity, is committed to a conservation-centric management and protection strategy. Wild-life focused eco-tourism management hinges on sustainability. Production-be it timber or non-timber forest produce is managed with sustainability at its core. Joint Forest Management to secure natural resources as well as livelihood security remains the major people-centric activity. Attempts are on to hone local artisans' skill in making value-added articles out of non-timber forest produce like bamboo and cane. Augmenting green cover on non-forest areas to achieve national targets of 33% of land area under green cover remains a forefront agenda. Intensive use of Information and Communication Technology supplemented by e-governance is under effective use to monitor ongoing forestry activities. Extensive use of digital platform to project a true picture of forest conservation forms the central theme.

(Source - www.mahaforest.gov.in)

A) VISION STATEMENT

This Working plan is the updation of working plan written by Shri. T. K. Choubey, the then CCF, working plan, Nagpur. The working plan of Gondia Forest Division encompasses the ideas of National Forest Policy, 1988 and lays more emphasis on conservation, preservation and protection of forest, wildlife and environment. As it is extension of earlier plan, prescription related to management practices, working circle formation and overlapping working circles remain unchanged from the previous working plan. Thus whole idea of the plan is that its prescription and information provided should be helpful for sustainable management of forests of Gondia Division.

B) GOALS AND OBJECTIVES OF MANAGEMENT:

- Transformation of forestry into an important sector in the states economy
- Ensuring stability of Eco-system.
- Ensuring equity of the various stakeholders in using the forest resource (especially needs of local community)
- Enhancing productivity of resources.
- Increasing forest cover.

- Conservation of Gene pool and Bio-diversity.
- Becoming a responsive and transparent organisation.

Primary Objectives

Sectoral:

- To recommend to the State and Central government, policies which will provide an enabling environment for various non-governmental players to play an active role in this sector.
- To generate and disseminate knowledge and information relevant to the sector to various stakeholders and provide Research & Development support to the sector.
- To regulate the activities of various players involved in forestry sector development.
- To undertake co-ordinated planning along with the other government departments and agencies.
- To develop a pro-active interface with political and executive arm of the government and public
- To act as a nodal agency at the grass-root levels in the forest lands.

Institutional:

- To develop skilled manpower base for the sector.
- To ensure technology upgradation.
- To promote a strong research base and build up an effective institution for effective knowledge management.

Operational:

- To maintain accurate and reliable data and information on forest resources and undertake periodic resource monitoring.
- To ensure effective and efficient management of forest estates under its control.
- Upgrade quality of land by soil and water conservation measures.
- To identify, map and conserve bio-diversity rich areas.
- To promote efficient utilization and value addition of forest produce including promotion of substitutes.

C) SWOT ANALYSIS FOR PRESCRIPTION OF STRATEGIES FOR ACHIEVING THE GOALS AND OBJECTIVES:

The analysis of the Strengths, Weakness, Opportunities and Threats for the whole gamut of prescriptions for the Division is not an easy task. Each of the Working Circle's

prescriptions have enough reasons to justify for the SWOT analysis. However, for this analysis, we have taken the internal and external factors that would have the impact on the achievement of the goal of the Plan and also the whole gamut of factors that would play their role in the success of the Plan like, Human and capital resources, Climatic factors, Human interference.

STRENGTHS	WEAKNESSES
<ol style="list-style-type: none"> 1. Well-regimented administration 2. Ability to maintain forest cover 3. Well intended course of action in place 4. Trained staff and well-manned 5. Finance improved over the last plan period. 6. A strong legislation and policy in place 7. Overall infrastructure of nurseries, depots, quarters in place. 8. Greater awareness of conservation than before 9. People involved in all forest's village through Joint Forest Management. 10. Rich flora and fauna 11. Well documented Working Plan 	<ol style="list-style-type: none"> 1. High red-tapism and resistance to change 2. Inability to create/maintain dense forests 3. Over-prevalence of degraded Teak forests 4. Lack of motivation and innovation 5. Lack of working knowledge on Working Plan prescriptions. 6. Funds deficient & not released in time 7. Lack of legal awareness and implementation 8. Area under zudpi jungle are honeycombed 9. Inadequate wireless communication, Wi-Fi / internet 10. Inability to tap local population Goodwill, most Joint Forest management are not upto the mark. 11. Many RET species are untackled
OPPORTUNITIES	THREATS
<ol style="list-style-type: none"> 1. Co-operation from Social Forestry Wing, District Administration, other Department. 2. Real time reporting and monitoring using latest technology. 3. New zudpi jungle offer new work sites 4. Funding for plantations from PSUs, Private Parties 5. Training in new tech and exposure visits for staff. 6. Funding from outside department 7. Creation of legal cell 	<ol style="list-style-type: none"> 1. High number of vacancies in forest staff. 2. Lack of technology transfer on silvicultural improvements 3. Forest fire from fields, villages, out of vengeance 4. Staff over-burdened with unproductive non-forestry works 5. Lack of control over encroachment, Grazing, Illicit felling

<p>8.Treatment of watersheds through Jalyukt Shivar, etc</p> <p>9.Creation of assets and infrastructure from CAMPA</p> <p>10.Involvement of informed public and NGOs in conservation</p> <p>11.Documentation and Biodiversity Studies involving educational Institutions, research on pathological problems in forests</p>	<p>6. Joint Forest Management villages are divided socially, politically</p> <p>7. Lack of funding</p> <p>8. Spread of disease, epidemics and teak hollowness</p> <p>9. Pressure from influential persons for works outside WP</p> <p>10. Late felling permission</p>
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D) EXPECTED OUTCOME: Of the many prescriptions that have been set for the treatment of the forests of the Division, the following are some of the outcomes that are expected to be achieved during the period of the plan.

a) Forest:

- i) **Extent of Forest Cover:** While it is our national policy to have least 33% of the geographical area under forest. In the case of Gondia, as per ISFR, 2023 it is seen that out of the geographical area of 5234 sq.kms. only 1903.81sq.kms. is covered under forests. This works out to be 36.37% of the geographical area.
- ii) **Regeneration:** Because of implementation of the plan, the forests are expected to be healthier and have better regeneration from opening of the canopy in 62561.968 ha. through SCI works and 22648.129 ha. due to IWC to be followed by intensive Aided Natural Regeneration works. Also due to better protection from fire and grazing, the area will be revitalized.
- iii) **Plantations:** It is expected that an area of 34078 ha. will be regenerated through the Afforestation Working Circles.
- iv) **Revenue:** It is expected that at the end of the plan 430 Nos. of coupes of SCI & IWC will have been worked producing 47,660 cum. Teak Timber, 22,500 cum. Teak Beat, 19056 (15880 stack), Teak Pole 1000 etc. resulting in Revenue of Rs.225.00 crores
- v) **Consolidation:** As Gondia Forest Division has 19875.680 ha zudpi jungle area, the boundaries of zudpi jungle should be demarcated during perid of implementation of the plan.

- vi) **Health and vitality:** At the end of the plan period, it is expected that the forests of the Division are more vivacious and revitalized with better regeneration, better composition of the crop, lesser disturbance of fire, grazing, illicit felling etc. resulting in better healthy forests.
- vii) **Wildlife:** The documentation and study of the faunal and floral diversity of the Division/District should be done during period of implementation of the plan.
- viii) **Biodiversity:** Because of the implementation of this Plan, Biodiversity appreciation and conservation will get a fillip in the Division. It is envisaged to have documentation and status study of medicinal plants, the lower life-forms (fungus, algae, ferns, moss & lichens), entomological study, herpetological study, etc. during the course of the plan through projects to be designed by the Division. At the end of the plan, Biodiversity Committee in all JFM-implemented village in the Division through the PRIs, which the Forest Department will catalyze, are expected to be formed.
- ix) **Soil and Water Conservation:** Throughout the plan period an area of different forms of regeneration and additional area as per site conditions are expected to be treated for soil and moisture conservation. Area to be treated will be revisited during mid term review.

E) ABSTRACT OF PLAN PRESCRIPTIONS:

Chapter No. (Vol-I, Part-II)	Para No/Sub Para no.	Prescribed Activity
A	B	C
2-SCI	2.6.2	Silvicultural System: *Selection-cum-Improvement system * Trees above Selection Girth are prescribed for felling as per principles of safeguarding future yield. * Openings created by felled trees would promote NR of light demander species * Hygienic operations (removal of dead, malformed, live high stumps) will improve the existing crop
	2.6.10.2	Coupe Demarcation, Preparation of Treatment Maps and Marking Techniques: Demarcation: One year in advance * Treatment Map to be prepared * A type: Protection area (A1: Steep slopes, A2: 20 M wide strips along streams, A3: excessively erosion prone areas) *B-type: Understocked and Blank areas (density <0.4)

Chapter No. (Vol-I, Part-II)	Para No/Sub Para no.	Prescribed Activity
A	B	C
		(a) B1-Area with rootstock and NR (b) B2-Area without NR * C-type: Pole crop and plantations * D-type: Well stocked areas (density >0.4)
	2.6.10.3	Marking: * A type area: No marking * B type: Dead and malformed trees, live high stumps * C type: Thinning marking * D type: Enumeration of trees in Approach girth class and above is prescribed. * Trees above selection girth as per regulation of Smythies safeguarding principle. Dead & malformed trees, live high stumps are to be marked.
	2.6.11	Subsidiary Operation : * CBO works: Subsequent year of main felling * CBO works like cutting left over marked trees, removal of damaged trees, singling of multiple coppice shoots, etc * NR or ANR should compulsorily be carried out immediately after CBO in the same year in D areas. This is necessary to regenerate the area felled as per Hon. SC orders * Cleaning operations: 6th Year
	2.6.12	Regeneration: * Natural Regeneration: NR of seed origin of valuable species to be preferred and managed through cultural operations in D area and B1 areas. * Artificial Regeneration: Only in B2 type area if site is suitable. * Strict protection from fire and grazing * Tending of natural regeneration of valuable species in B Type area.
	2.6.13	SMC Works: * Gully plugging and other SMC works, as described in the chapter of Miscellaneous Regulations shall be taken up in the A3 type area. * SMC works will be along with marking operation and completed before on set of monsoon. * SMC Working are to be based on the requirement of site.

Chapter No. (Vol-I, Part-II)	Para No/Sub Para no.	Prescribed Activity
A	B	C
3- Improve ment Working Circle	3.6.2	<p>Silvicultural System :</p> <ul style="list-style-type: none"> * Hygienic operation of improvement felling. * Adequate growing space is provided to trees of valuable species. * The improvement felling supplemented by tending of naturally generated crop & root stock will aid in transition of middle aged stem to maturity. * The species whose population in the 'stand' dynamics is less than 1% shall be retained till they reached the rotation age.
	3.6.10.1	<p>Coupe Demarcation & Treatment Map :</p> <ul style="list-style-type: none"> * Demarcation and Marking: One year in advance * Treatment Map to be prepared * A type: Protection area (A1: Steep slopes, A2: 20 M wide strips along streams, A3: excessively erosion prone areas) * B-type: Understocked areas (density <0.4) * C-type: Congested Pole crop * D-type: Well stocked areas (density >0.4)
	3.6.10.2	<p>Marking :</p> <ul style="list-style-type: none"> * A type area: No marking * B type: All dead trees, live high stumps * C type: The congested pole crop shall be marked for thinning. * D type: All fruit bearing species shall be reserved. * All dead & malformed trees retaining 2 trees per ha. and all live high stumps shall be marked. For felling. * Matured trees that have developed hollowness and show visual sign of decay will be marked for felling.
	3.6.10.3	<p>SMC Works:</p> <ul style="list-style-type: none"> * SMC works, as described in the chapter of Miscellaneous Regulations are prescribed in A & B type area.
	3.6.11	<p>Subsidiary Operations:</p> <ul style="list-style-type: none"> * Cleaning operations: 6th Year * Thinning is proposed to be carried out in the patches of Dense pole crop by maintaining average spacing of one third of the crop height.
	3.6.12	<p>Regeneration :</p> <ul style="list-style-type: none"> * Natural Regeneration: NR of seed origin of valuable species to be preferred and managed through cultural operations. * Artificial Regeneration: Only in B type area if site is suitable. * Strict protection from fire and grazing * Tending operation for Natural regeneration in the 'D' type area & Root stock management in the 'B' type shall be taken up.

Chapter No. (Vol-I, Part-II)	Para No/Sub Para no.	Prescribed Activity
A	B	C
4-Afforestation Working Circle	4.6.10.1	<p>Coupe Demarcation & Treatment Map:</p> <ul style="list-style-type: none"> * Demarcation and treatment map will be prepared one year in advance. * Treatment map would show A, B, C, D areas * A type: Protection area (A1: Steep slopes, A2: 30 M wide strips on both side of streams. * B-type: Understocked areas (density <0.4) * C-type: Congested Pole crop * D-type: Well stocked areas (density >0.4)
	4.6.2	<p>Silvicultural System:</p> <ul style="list-style-type: none"> * Only hygienic fellings prescribed (Dead, live high stumps) * Plantation work in B type areas. * Planting of Tall seedlings prescribed. * Not more than 50 ha. plantation per coupe. * JFMCs to be actively involved.
	4.6.12	<p>Regeneration:</p> <ul style="list-style-type: none"> * Tending of Natural regeneration & existing root stock is prescribed to be given preference over planation. * Cultural operations for natural regeneration in 'D' type areas Root stock management in 'B' type areas are prescribed.
	4.6.10.2	<p>SMC Works:</p> <ul style="list-style-type: none"> * SMC works will be done as prescribed in there event paras under Miscellaneous Regulation. No specific quantum of such works has been prescribed.
5-Protection Working Circle	5.6.10.1	<p>Coupe Demarcation & Treatment Map:</p> <ul style="list-style-type: none"> * Demarcation and Marking: One year in advance Treatment Map to be prepared * A type: Protection area (A1: Steep slopes, A2: 20 M wide strips along streams, A3: excessively erosion prone areas) * B-type: Understocked and Blank areas (density less than 0.3) * C-type: Group of naturally green poles. * D-type: Well stocked forest patches.
	5.6.10.2	<p>Treatment:</p> <ul style="list-style-type: none"> * A type area: Harvesting of standing trees is strictly prohibited. * B type: No. harvesting. <p>All seedling & saplings of valuable species more than 1 mtr. in height will be nursed as future crop</p> <ul style="list-style-type: none"> * C type: Group of pole crop will be thinned by maintaining average

Chapter No. (Vol-I, Part-II)	Para No/Sub Para no.	Prescribed Activity
A	B	C
		spacing. * No planting will be done. * D type: No harvesting of green trees & Plantation is not prescribed.
	5.6.2	Silvicultural System: * Silviculture system is proposed on the pattern of watershed management. * Harvesting of green trees is prohibited. * Removal of dead trees by retaining two dead trees per ha. as snags is permitted.
	5.6.11	Regeneration: * Natural Regeneration: All seedlings and saplings of valuable species more than 1 meter height will be nursed as future crop. * Strict protection from fire and grazing
6- Miscellaneous Working Circle	6.3	Treatment Prescribed: * Protected Forests and unclassified forests not in database: Prescriptions of the Afforestation Working Circle will apply to these areas after inclusion in the database; as these forests are generally blank or open in stocking. * Disforestation area not marked on the forest map: disforestation maps shall be prepared by the division according to the disforestation notification and the revenue maps. * Area under infra-structural facilities: The division is proposed to prepare their maps, and record present condition and occupancy of all the buildings in the forests for the purpose of their delineation on the forest maps and inclusion in the digital database. It is proposed to complete the work in first two years of the plan. * Religious and archaeological sites: Their potential as sites for eco-tourism shall be explored and used to furtherance of eco-tourism in the division. * Areas diverted for irrigation projects and under submergence: No work is proposed for the forest areas under submergence, but the prescriptions of the Protection Working Circle will apply to the forests above the high flood level. * Areas found eligible for regularisation of forest encroachment * Zudpi Jungle Areas: Zudpi Jungle areas included in this working

Chapter No. (Vol-I, Part-II)	Para No/Sub Para no.	Prescribed Activity
A	B	C
		circle are prescribed for survey and demarcation as described in the chapter of miscellaneous regulation.
7-Bamboo (Overlapping) Working Circle	7.6.2	Silvicultural System: Silvicultural system shall be the Culm selection system.
	7.6.10.2	Method of Harvesting: Demarcation, Estimation of Clumps
	7.6.11	Subsidiary Silvicultural Operations: All clumps will be cleaned during the coupe working.
	7.6.12	Regeneration: Natural regeneration should be given preference over artificial regeneration since the forest area has mixed species.
8-Wildlife (Overlapping) Working Circle	8.4.6.1	Recommendations for Future Management: * Standing Order of PCCF (WL) to be scrupulously implemented. * Habitat improvement works like waterhole development, meadow development to be taken up in suitable areas. * Creation of database w.r.t. riparian zones, saltlicks, natural wallows, resting places etc to be created.
	8.4.6.2	Protection Measures For Wildlife: * Vaccination of livestock to be monitored * Intelligence gathering to check wildlife trade * Secret service fund to be effectively used. * Regular Sensitization of staff * During marking, at least 2 dead trees per ha is to be kept as snags. * No fruit tree to be marked. * Tendu Phadis / labour camps should not be close to waterholes. * Compensation as per Govt. orders to be dispersed immediately and transparently. * Effective control on forest fires. * Eco-development works to be started either through EDCs or JFMCs in wildlife rich areas * Massive awareness creation in village communities, schools, colleges, civil society, public representatives etc
9-NTFP (Overlapping) Working Circle	9.7.1	Future Management: * Documentation of NTFP collection.

Chapter No. (Vol-I, Part-II)	Para No/Sub Para no.	Prescribed Activity
A	B	C
Circle		<ul style="list-style-type: none"> * JFMCs to be actively involved in NTFP collection and processing. * Scientific method for Gum tapping as per rules suggested by FRI to be used. * Regular trainings for JFMCs to be conducted for capacity building in NTFP collection and processing.
10-JFM (Overlapping) Working Circle	10.6.5	<p>General Prescription:</p> <ul style="list-style-type: none"> * JFM micro plans are to be dovetailed with broad prescriptions of approved working plan. * Maintenance of forest boundary, removal of encroachments, control over illicit cutting, illegal grazing, fire and wildlife offences shall receive priority apart from regularly undertaken works such as SMC & Plantations. * Transparency in programme has to be ensured through transparent payment mechanisms. * Villages which have not received funds should also be accorded importance.
13-Survey and Boundary demarcation	13.1.5	<p>Boundary demarcation and 1/5th boundary demarcation scheme:</p> <ul style="list-style-type: none"> * Boundary demarcation of all un demarcated areas (Entire Zudpi jungle area, Acquired Private Forest & Non-Forest land taken over for C.A.& undemarcated PF) to be accomplished in first three years of the Plan. * Boundary pillar which is not easily vulnerable to damage. * Three years Survey and Demarcation Programme * Boundary demarcation is necessary due to honeycombing. * Updation of area registers * Where claims are finally rejected, removal of such encroachments.

**F) WORKS PRESCRIBED DURING THE PLAN PERIOD MUST BE GIVEN IN
A TABULAR FORM ALONG WITH ANNUAL TARGET**

Chapter No Vol.I, Part-II	Para No Sub para para No	Prescribed Activity	Year wise (year 1 to 10) distribution physical target (Ha.)										
			D										
A	B	C	D										
2-SCI	2.6.10.2	Demarcation and marking	2985	2985	2985	2985	2985	2985	2985	2985	2985	2985	
	2.6.10.1, 2.6.10.2	Timber/ Firewood working "D" Area	As per actual "D" area										
	2.6.12	Natural Regeneration	500	500	500	500	500	500	500	500	500	500	
	2.6.12	Plantation works											
		PPO/PYO (Pre-planting works)		400	400	400	400	400	400	400	400	400	400
		FYO (First year operations)		400	400	400	400	400	400	400	400	400	400
		SYO (Second year operations)		400	400	400	400	400	400	400	400	400	400
		TYO (Third year operations)		400	400	400	400	400	400	400	400	400	400
		4th YO (Fourth year operations)		400	400	400	400	400	400	400	400	400	400
	2.6.13	Soil and moisture conservation works		As per site suitability									
2.6.11		Cut Back Operation	As per actual 'D' area										
3-IWC	3.6.10.1, 3.6.10.2	Demarcation and marking	1152	1152	1152	1152	1152	1152	1152	1152	1152	1152	
	3.6.2	Coupe working (Hygenic Felling) (D+B area)	As per actual 'D' area										
	3.6.12	Natural Regeneration		200	200	200	200	200	200	200	200	200	200
		PPO/PYO (Pre-planting works)		150	150	150	150	150	150	150	150	150	150
		FYO (First year operations)		150	150	150	150	150	150	150	150	150	150
		SYO (Second year operations)		150	150	150	150	150	150	150	150	150	150
		TYO (Third year operations)		150	150	150	150	150	150	150	150	150	150
		4th YO (Fourth year operations)		150	150	150	150	150	150	150	150	150	150
	3.6.10	Soil and moisture conservation works		As per site suitability									
		3.6.11	CBO	As per actual 'D' area									
4-AFF.	4.6.10.1	Demarcation and marking	1834	1834	1834	1834	1834	1834	1834	1834	1834	1834	
	4.6.2	Coupe working (Hygenic Felling)	As per actual 'D' area										
	4.6.12	PPO/PYO (Pre-planting works)		500	500	500	500	500	500	500	500	500	500
		FYO (First year operations)		500	500	500	500	500	500	500	500	500	500
		SYO (Second year operations)		500	500	500	500	500	500	500	500	500	500
		TYO (Third year operations)		500	500	500	500	500	500	500	500	500	500
	4.6.12	4th YO (Fourth year operations)		500	500	500	500	500	500	500	500	500	500
		5thYO (Fifth year operations)		500	500	500	500	500	500	500	500	500	500
	4.6.10.2	Soil and moisture conservation works		As per site suitability									

5- Protection	5.6.10.1	Demarcation and marking	570	570	570	570	570	570	570	570	570	570
	5.6.10.2	Soil and moisture conservation works	As per actual 'D' area									
13- (Survey and Boundary demarcation)	13.1.5	Fixing Boundary Pillars (Artificial & Natural RF Boundary)	As per new boundary demarcation scheme and site suitability									
		Fixing Boundary Pillars (Artificial & Natural PF Boundary)										
	New Demarcation of Zudpi Jungle/ uclassified forest	19875 ha. zudpi jungle to be demarcated in 4 years										
7- Bamboo (Overlapping)	7.6.2	Demarcation and marking	As per actual area of working									
	7.6.10.2	Bamboo harvesting										
	7.6.11	Cleaning										
	7.6.13	Fire protection										
8-Wild Life (Overlapping) W.C.	8.4.4	Maintenance of Water Holes	50	50	50	50	50	50	50	50	50	50
		Habitat improvement	25	25	25	25	25	25	25	25	25	25
9-NTFP (Overlapping) W.C.	9.6.3	Training for collection method	25	25	25	25	25	25	25	25	25	25
10- JFM (Overlapping) W.C	10.7	Awareness generation	364	364	364	364	364	364	364	364	364	364
		Microplan preparation	36	36	36	36	36	36	36	36	36	40

II. GLOSSARY OF TERMS

Terms	Miscellaneous
Bidi	Handmade cigarette wrapped in Tendu leaf.
Bir	An area reserved to grow grass.
Burad	Person who makes mats, baskets etc. of bamboos
Dholi	Containers to store grain
Doh	A deep pond in a river or stream
Geru	Red ochre or red earth
Ghat	A road with a steep gradient.
Ghee	Clarified buffalo-Milk, butter.
Gully	Channel
Jagir	An estate belonging to a Zamindar.
Jagirdar	The holder of Jagir.
Jamindari	An estate belonging to a Zamindar.
Jhiras	Temporary small wells dug in nalas during summer.
Juar	Cultivated millets (<i>Sorghum vulgare</i>).
Kaccha (roads)	Temporary (roads).
Kankar	Lime nodules.
Katha	Catechu.

Kharif	Monsoon crop.
Khasara No.	Serial number given to any portion of land entered in land records
Khories	Valleys in between two hills or hillocks.
Nista	Land tenure system which existed in Vidarbha.
Malki lands	Lands belonging to private individuals.
Mouza	A village area.
Murum	A reddish hard soil.
Naka	Barrier on road for checking forest produce in transit.
Nala	A water courses.
Nistar	Forest produce required for bona-fide agricultural or domestic needs
Nistar Patrak	Record of Nistar rights on Government Land.

III. LIST OF FLORA

Local and Botanical Names of Plants Occurring in Gondia Forest Division

A. Tree

Sr. No.	Local Name	Botanical Name	Family
1	Amaltas/Bahawa	<i>Cassia fistula, (L.)</i>	Caesalpiaceae
2	Apta /Bhosa	<i>Bauhinia racemosa, (Lamk.)</i>	Caesalpiaceae
3	Aonla	<i>Phyllanthus emblica, (L.)</i>	Euphorbiaceae
4	Aran	<i>Cassine glauca, (Rottb.)</i>	Celastraceae
5	Arjun	<i>Terminalia arjuna, (Roxb.) W&A</i>	Combretaceae
6	Ain/Saja	<i>Terminalia tomentosa</i>	Combretaceae
7	Babul / Babhool	<i>Acacia nilotica (L.)</i>	Mimosaceae
8	Bad/Wad	<i>Ficus benghalensis (L.)</i>	Moraceae
9	Behada	<i>Terminalia bellerica</i> <i>(Gaertn.) Roxb.</i>	Combretaceae
10	Bel	<i>Aegle marmelos (L.)</i>	Correa. Rutaceae
11	Bhirra	<i>Chloroxylon swietenia (Roxb.)</i>	DCRutaceae
12	Biba/Bhilawa	<i>Semecarpus anacardium (L.F.)</i>	Anacardiaceae
13	Bija	<i>Pterocarpus smarsupium, (Roxb.)</i>	Fabaceae
14	Bistendu	<i>Diospyros montana, (Roxb.)</i>	Ebenaceae
15	Bor/Ber	<i>Ziziphus mauritiana, (Lamk.)</i>	Rhamnaceae
16	Char/Chironji	<i>Buchanania lanzan (Spreng.)</i>	Anacardiaceae

Sr. No.	Local Name	Botanical Name	Family
17	Chichwa	<i>Albizzia odoratissima, (Lf.)</i>	Mimosaseae
18	Chinch/Imli	<i>Tamarindus indica, (L.)</i>	Caesalpinaceae
19	Datrangi /Desipapdi	<i>Ehretia laevis, (Roxb.)</i>	Ehretiaceae
20	Dhaman	<i>Grewia tiliifolia, (vahl.)</i>	Tiliaceae
21	Dhaora/Dhawada	<i>Anogeissus latifolia, (R.Br. ex. DC)</i>	Combretaceae
22	Dhoban	<i>Dalbergia paniculata, (Roxb.)</i>	Fabaceae
23	Dudhi/Kala kuta	<i>Wrightia tinctoria</i>	
24	Garari	<i>Cleistanthus collinus, (Roxb.) Bth. ex. Hook. F.</i>	Euphorbiaceae
25	Ghogar	<i>Gardenia latifolia, (Soland.)</i>	Rubiaceae
26	Ghoti/Ghot	<i>Ziziphus xylopyra, (Sedgw)</i>	SantRhamnaceae
27	Gogal/Gongal	<i>Cochlospermum religiosum, (L.)</i>	Chochlospermaceae
28	Gondan / Chikati	<i>Cortia dichotona</i>	
29	Gular/Umber	<i>Ficus glomerata, (Roxb.)</i>	Moraceae
30	Haldu	<i>Adina cordifolia, (Roxb.) Hook.F</i>	Rubiaceae
31	Hiwar	<i>Acacia leucophloea</i>	Mimoseae
32	Hirda/Harra	<i>Terminalia chebula, (Retz.)</i>	Combretaceae
33	Jambhul/Jamun	<i>Syzygium cumini (L.)</i>	SkeelsMyrtaceae
34	Kalaphetra	<i>Randia uliginosa, (DG)</i>	Rubiaceae
35	Kakad	<i>Garuga pinnata, (Roxb)</i>	Burseraceae
36	Kakai	<i>Flacourtia indica, (Burm. f.)</i>	Flacourtiaceae
37	Kanchan/Kachnar	<i>Bauhinia variegata</i>	Salpiniaceae
38	Karai	<i>Milusa velutina, (Dunal)</i>	Annonaceae
39	Keolar	<i>Bauhinia purpurea</i>	Salpiniaceae
40	Kalam/Mundi	<i>Mitragyna parvifolia, (Roxb)</i>	Rubiaceae
41	Kakad	<i>Gaega pinnata</i>	Fabaceae
42	Karanj	<i>Pongamia pinnata, (L.)</i>	Fabaceae
43	Kateain/Kasai	<i>Bridelia retusa, (L.) spr.</i>	Euphorbiaceae
44	Katsawar/Semal	<i>Bombax ceiba, (L.)</i>	Bombaceae
45	Kinhi	<i>Alberia procera</i>	Fabaceae
46	Khair	<i>Acacia catechu, (L.F.)</i>	Mimosaseae
47	Khirni	<i>Manilkara hexandra, (Roxb.)</i>	Sapotaceae
48	Kuda	<i>Holorrhena pubescens</i>	Apocynaceae
49	Kullu/Kulu	<i>Sterculia urens, (Roxb.)</i>	Sterculiaceae

Sr. No.	Local Name	Botanical Name	Family
50	Kumbhi	<i>Careya arborea</i> , (Roxb.)	Lecythidiaceae
51	Kusum	<i>Schleichera oleosa</i> , (Lour.) oken.	Sapindaceae
52	Lendia/Lenda	<i>Lagerstroemia parviflora</i> , (Roxb.)	Lythraceae
53	Lokhandi	<i>Ixora arborea</i> , (Roxb.) ex.Sm	Rubiaceae
54	Maharukh	<i>Ailanthus excelsa</i> , (Roxb.)	Simaroubaceae
55	Medsing	<i>Dolichandrone falcata</i> , (Seem.)	Bignoniaceae
56	Moha/Mahuwa	<i>Madhuca indica</i> (Gmel)	Sapotaceae
57	Mokha	<i>Schrebera swietenoides</i> , (Roxb.)	Oleaceae
58	Moyen/Mowai	<i>Lannea coromandelica</i> (Hout.) Merr.	Anacardiaceae
59	Neem	<i>Azadirachta indica</i> , (Juss.)	Meliaceae
60	Padar	<i>Stereospermum suaveolens</i> (DC)	Bignoniaceae
61	Palas	<i>Butea monosperma</i> (Lam.)	Fabaceae
62	Pangara	<i>Erythrina variegata</i> (L.)	Fabaceae
63	Rohan	<i>Soymida febrifuga</i> (A. Juss.)	Meliaceae
64	Sag/Sagwan/Teak	<i>Tectona grandis</i> , (L.F.)	Verbenaceae
65	Salai	<i>Boswellia serrata</i> , (Roxb.ex. Colebr)	Burseraceae
66	Shisham	<i>Dalbergia latifolia</i> , (Roxb.)	Fabaceae
67	Shiwan/Siwan	<i>Gmelina arborea</i> , (Roxb.)	Verbenaceae
68	Sindi/Chhindi	<i>Phoenix sylvestris</i> , (Linn)	Arecaceae (Palmae)
69	Siras (Black)	<i>Albizzia lebbek</i> , (L.) Bth.	Mimosaseae
70	Siras (White)	<i>Albizzia procera</i> , (Roxb.) Bth.	Mimosaseae
71	Sissoo	<i>Dalbergia sissoo</i> (Roxb.)	Fabaceae
72	Sitaphal	<i>Annona squamosa</i> , (L.)	Annonaceae
73	Surya	<i>Xylia xylocarpa</i> , (Roxb)	Mimosaseae
74	Tendu	<i>Diospyros malanoxylon</i> (Roxb)	Ebenaceae
75	Tiwas/Tinsa	<i>Ougeinia dalbergioides</i> , (Roxb.)	Fabaceae
76	Tondri	<i>Casearia elliptica</i>	Salicaceae
77	Umber	<i>Ficus glomerata</i> , (L.)	Moraceae
78	Wandra/Bainsa	<i>Salix tetrasperma</i> , (Roxb)	Salicaceae
79	Warang/Baranga	<i>Kydia calycina</i> , (Roxb.)	Malvaceae

B. Shrubs

Sr. No.	Local Name	Botanical Name	Family
1	Aal	<i>Morinda citrifolia</i> , (Linn.)	Rubiaceae
2	Adulsa	<i>Justicia adhatoda</i>	Acanthaceae
3	Waghati	<i>Caparis zeylanica</i>	Capparaceae
4	Bharati	<i>Maytenus emarginata</i> , (Wild)	Celastraceae
5	Bhawarmal/ Bain Champa	<i>Hamiltonia suaveolens</i> , (Roxb.)	Rubiaceae
6	Dekamali	<i>Gardenia gummifera</i> (L.F.)	Rubiaceae
7	Gautri/Gaturli	<i>Grewia hirsuta</i> (Vahl, symb.	Tiliaceae
8	Ghaneri/Ulta	<i>Lantana camara</i> , (Linn.)	Verbenaceae
9	Nirguri	<i>Vitex negunto</i>	Menispermaceae
10	Isharmul/saapsan	<i>Aristolochia indica</i>	Aristolochiaceae
11	Jilbili/Dhayti	<i>Woodfordia fruticosa</i> , (Kurz)	Lythraceae
12	Kaladhotra	<i>Datura metel</i> , (Linn)	Solanaceae
13	Karwand	<i>Carissa arandus</i>	Apocynaceae
14	Munedsheng	<i>Helictenes isora</i>	Menispermaceae
15	Katekoranti	<i>Barleria prionites</i> , (Linn.)	Acanthaceae
16	Katumber/Auadumber	<i>Ficus hispida</i> , (Linn)	Moraceae

C. Herbs

Sr. No.	Local Name	Botanical Name	Family
1	Aghada/Apamarg	<i>Achyranthes aspera</i>	Amaranthaceae
2	Ambuti/Tipani	<i>Oxalis corniculata</i>	Oxalidaceae
3	Anantmul	<i>Hemidesmus indicus</i>	Periplocaceae
4	Bhui Aonla	<i>Phyllanthus niruri</i>	Euphorbiaceae
5	Bhuininb /Kalmegh	<i>Andrographis paniculata</i>	Acanthaceae
6	Dudhivel/Govrdhan	<i>Euphorbia hirta</i>	Euphorbiaceae
7	Divali	<i>Tephrosia hamiltonii</i> , (Drumm)	Fabaceae
8	Gokru	<i>Tribulus terrestris</i> (Linn)	Zygophyllaceae
9	Gokukata/Talimkhana	<i>Hygrophilla auriculata</i>	Acanthaceae
10	Isapghol/Aspghol	<i>Plantago ovata</i>	Plantaginaceae
11	Kamarmodi	<i>Tridax procumbens</i> (Linn)	Asteraceae
12	Kamuni	<i>Solanum nigrum</i>	Solanaceae
13	Kali Musli	<i>Curculigo orchioides</i>	Hypoxidaceae
14	Lajwanti	<i>Mimosa pudica</i>	Mimosaseae

Sr. No.	Local Name	Botanical Name	Family
15	Pivladhotra	<i>Argemone mexicana (L.)</i>	Papaveraceae
16	Pivilitilwan	<i>Cleome viscosa (Linn)</i>	Cleomaceae
17	Rantulasi/Bantulasi	<i>Hyptis suaveolens (Linn)</i>	Lamiaceae
18	Rantur	<i>Atylosia scarabaeoides, (L.)</i>	Fabaceae
19	Ranhalad	<i>Curcuma aromatic</i>	Zyngiberaceae
20	Rantambaku	<i>Lobelia nicotianaefolia</i>	Lobeliaceae
21	Sarpgandha	<i>Rauwolfia serpentina</i>	Apocynaceae
22	Tarota	<i>Cassia tora, (Linn)</i>	Caesalpinaceae
23	Waghnakhi	<i>Martynia annua, (Linn)</i>	Martyniaceae

D. Bamboos and Grasses

Sr. No.	Local Name	Botanical Name	Family
1	Bans/Bamboo	<i>Dendrocalamus strictus,</i> <i>(Roxb)</i>	Poaceae/ (Gramineae)
2	Bhurbhusi	<i>Eragrostic tenella, (L.)</i>	Poaceae/(Gramineae)
3	Dab/Dabat/ Phulya	<i>Imperata cylindrica, (Beauv)</i>	Poaceae/(Gramineae)
4	Diwartan	<i>Andropogan pumilus, (Roxb)</i>	Poaceae/(Gramineae)
5	Hariyalli/Doob	<i>Cynodon dactylon, (Prs)</i>	Poaceae/(Gramineae)
6	Gadasheda	<i>Chrysopogon fulvus, (Spr)</i>	Poaceae/(Gramineae)
7	Ghonad	<i>Themeda quadrivalvis (L.),</i>	O. ktzePoaceae/(Gramineae)
8	Fuler	<i>Arundinella setosa, (Trin)</i>	Poaceae/(Gramineae)
9	Katanbahari/ Kusara	<i>Aristida funiculata,</i> <i>(Trin. et. Rupr)</i>	Poaceae/(Gramineae)
10	Katang bamboo	<i>Bamboosa arundinacea, (Willd)</i>	Poaceae/(Gramineae)
11	Khas	<i>Vetiveri azizaniodes, (Linn)</i>	Nesh Poaceae/ (Gramineae)
12	Kusal	<i>Heteropogon contortus, (Linn)</i>	Poaceae/(Gramineae)
13	Marvel (Small)	<i>Dichanthium annulatum,</i> <i>(Forssk)</i>	Poaceae/(Gramineae)
14	Marvel (Big)	<i>Dichanthium aristatum (Poir)</i>	Poaceae/(Gramineae)
15	Phulkia/Ponai	<i>Apluda mutica, (Linn)</i>	Poaceae/(Gramineae)
16	Sabai / Sum	<i>Ischaemum angustifolium</i> <i>(Hack)</i>	Poaceae/(Gramineae)
17	Sheda	<i>Sehima nervosum (Rottl.)</i>	Poaceae/(Gramineae)
18	Tikhadi	<i>Cymbopogon martinii (Roxb.)</i>	Poaceae/(Gramineae)

E. Climber

Sr. No.	Local Name	Botanical Name	Family
1	Aradphari/harduli	<i>Olex scandens, (Roxb.)</i>	Olacaceae
2	Chilati	<i>Mimosa hamata (Willd)</i>	Mimosaseae
3	Dhimarwel/Malkagi	<i>Celastrus paniculata (Willd)</i>	Celastraceae
4	Dhudhi/Bokadwel	<i>Cryptolepis buchananii,</i> <i>R. & S.</i>	Periplocaceae
5	Eruni	<i>Zizyphus oenoplia, (L.) Mill</i>	Rhamnaceae
6	Gunj/Raktvel	<i>Abrus precatorius, (L.)</i>	Fabaceae
7	Gulvel	<i>Tinospora cordifolia, (Willd)</i>	Menispermaceae
8	Khaj Kujari	<i>Mucuna pruriens, (L.) D.C.</i>	Fabaceae
9	Khadyanag/ Langali Karkari	<i>Gloriosa superba, (L.)</i>	Liliaceae
10	Khobarvel/Anantmul	<i>Hemidesmus indicus, (L.) Ait.</i>	Periplocaceae
11	Kukudranji	<i>Calycopteris floribunda,</i> <i>(Lam)</i>	Combretaceae
12	Mahulvel	<i>Bauhinia vahlii, (Wand. A)</i>	Caesalpiniaceae
13	Nasbel	<i>Millettia extensa, (Bth.)</i> <i>Baker</i>	Papilionaceae
14	Papri Lalbel	<i>Vantilago denticulata, (Willd)</i>	Rhamnaceae
15	Palasvel	<i>Butea superba (Roxb)</i>	Fabaceae
16	Piwarvel Piwarvel	<i>Combretum ovalifolium</i> <i>(Roxb)</i>	Combretaceae
17	Ramdaton	<i>Smilax macrophylla,</i>	Smilacaceae
18	Vasanvel	<i>Cocculus hirsutus, (L.) Diels.</i>	Menispermaceae

F. Parasites & Saprophytes

Sr. No.	Local Name	Botanical Name	Family
1	Amarvel	<i>Cuscuta reflexa, (Roxb)</i>	Cuscutaceae
2	Scabra	<i>Stylosanthes scabra</i>	Leguminoceae
3	Bandha/ Bandh	<i>Vanda tessellata, (Roxb)</i>	Orchidaceae

G. List of Medicinal Plants in Gondia Forest Division

Sr.No.	Local Name	Botanical Name
1	Korfad	<i>Aloe barbadensis Mill</i>
2	Palas	<i>Butea monosperna (Lam) taub</i>
3	Kallavi / Karkani	<i>Gloriosa superba L.</i>
4	BhuiNim	<i>Phyllanthus fraternus</i>
5	Sagar Goti	<i>Caesalpinia bonducella</i>
6	Pandhari Rui	<i>Calotropis gigantea</i>
7	Safed Musali	<i>Chlorophytum borvilianum</i>
8	Bel	<i>Aegle marmelos (L) Correa</i>
9	Neem	<i>Azadirachta indica (Juss)</i>
10	Ran Halad	<i>Curculigo orchioides (GautnFruet)</i>
11	Aonla	<i>Phyllanthus emblica (L)</i>
12	Behada	<i>Terminalia bellerica (Gautn) roxb</i>
13	Kambarmodi	<i>Tridax procumbens (Linn)</i>
14	Aghada	<i>Achyranthes aspera</i>
15	Karu	<i>Sterculia urens (Roxb)</i>
16	Nivdung	<i>Echinocactu sgrusonii</i>
17	Katsawar (Semal)	<i>Bombax celiba (L)</i>
18	Medsing	<i>Dolichandrone falcata (seem)</i>
19	Kadii Patta	<i>Murraya koenigii (L) Sprengel</i>
20	Pandhari Gunj	<i>Abrus precatorius (L)</i>
21	Aajan, Arjun, Kahu	<i>Terminalia arjuna (Roxb)</i>
22	Maharukh	<i>Ailanthus excels (Roxb)</i>
23	Tirunii	<i>Not known</i>
24	Yerandi	<i>Ricinus communis</i>
25	Umbaar	<i>Ficus glomerata (Roxb)</i>
26	Vasanvel	<i>Cocculus hirsutus (L)</i>
27	Nirgudii	<i>Vitex negundo (L)</i>
28	Shatawar	<i>Asparagus racemosus</i>
29	Jatamasii	<i>Nardostachys jatamansi</i>
30	Haranwell	<i>Not known</i>
31	Gokharu	<i>Tribulus terrestris</i>
32	Aamaltaas	<i>Cassia fistula (L)</i>
33	Bamboo	<i>Dendro calamus stricts</i>
34	Hirda	<i>Terminalia chebula (Retz)</i>

Sr.No.	Local Name	Botanical Name
35	Kachnaar (Aapta)	<i>Bauhinia racemosa</i>
36	Kudwa	<i>Holarrhena anthidysentrica (Wall)</i>
37	Indrawan	<i>Not known</i>
38	Niroki	<i>Not known</i>
39	Wagnakh	<i>Martynia annua (Linn)</i>
40	Ridda/Ritha	<i>Sapindus emarginatus</i>
41	Aawan	<i>Not known</i>
42	Nayaa	<i>Not known</i>
43	Adulsa	<i>Adhatoda vasaka</i>
44	Tarota	<i>Cassia tora L.</i>
45	Pen Ghagara	<i>Not known</i>
46	Shisham	<i>Dalbergia latifolla (Roxb)</i>
47	Khandu Chakka	<i>Clorodendrum</i>
48	Tulas	<i>Ocinum sanctum</i>
49	Sitaphal	<i>Annona squamosa (L)</i>
50	Babhul	<i>Acacia nilotica (L)</i>
51	Hiwar	<i>Acacia leucopholoea</i>
52	Lendia/Lenda	<i>Lagerstroemia parviflora</i>
53	Lokhandi	<i>Ixora arborea (Roxb)</i>
54	Malkagni	<i>Celastrus paniculata (Willd)</i>
55	Moha	<i>Madhuca indica</i>
56	Aal/ Aali	<i>Morinda pubescens</i>
57	Sag	<i>Tectona grandis</i>
58	Kusal	<i>Heteropogon contorjus</i>
59	Rohan	<i>Soymida febrifuga</i>
60	Biba/Bhilawa	<i>Semecarpus anacardium</i>
61	Ran halad	<i>Zingiber officinate</i>
62	ChandraJyoti	<i>Jatropha curcas</i>
63	Mowai	<i>Lannea coromandilica</i>
64	Bharati	<i>Maytenus emarginate</i>

IV. LIST OF FAUNA

The Common and Zoological Names of Animals, Birds & Reptiles Commonly Found in the Gondia Forest Division

A. Mammals

Sr. No.	Common Name	Zoological Name	IUCN Status
1	Tiger	<i>Panthera tigris</i>	Endangered
2	Leopard	<i>Panthera pardus</i>	Near Threatened
3	Striped Hyena	<i>Hyaena hyaena</i>	Near Threatened
4	Wild dog	<i>Cuon alpinus</i>	Endangered
5	Jackal	<i>Canis aureus</i>	Least Concern
6	Fox	<i>Vulpes bengalensis</i>	Least Concern
7	Small Indian Civet	<i>Civet viverricerla</i>	least concern
8	Jungle cat	<i>Felis chaus</i>	Least Concern
9	Nilgai	<i>Boselaphus tragocamelus</i>	Least Concern
10	Indian gaur	<i>Bos gaurus</i>	Vulnerable
11	Sambhar	<i>Cervus unicolor</i>	Vulnerable
12	Cheetal	<i>Axis axis</i>	Least Concern
13	Barking deer	<i>Muntiacus muntjak</i>	Least Concern
14	Wild boar	<i>Sus scrofa</i>	Least Concern
15	Sloth bear	<i>Melursus ursinus</i>	Vulnerable
16	Ratel	<i>Mellivora capensis</i>	Least concern
17	Four horned antelope	<i>Tetracerus quadricornis</i>	Vulnerable
18	Langur	<i>Presbytis entellus</i>	Least Concern
19	Pangolin	<i>Manis crassicaudata</i>	Entageres
20	Three striped Palm squirrel	<i>Funambulus palmarum</i>	Least Concern
21	Porcupine	<i>Hystrix indica</i>	Least Concern
22	Rufous Tailed Hare	<i>Lepus nigricollis</i> <i>Ruficaudatus</i>	Least Concern

**B. List of Birds in Gondia District, Maharashtra
(As per Bahar Nature Foundation Document)**

Sr. No	Common Name	Scientific Name	Marathi Name
Order: GALLIFORMES: Partridge & Quails			
Family: PHASIANIDAE			
1	Grey Francolin	<i>Francolinus pondicerianus</i>	गावतितीर
2	Painted Francolin	<i>Francolinus pictus</i>	रंगीततितीर
3	Common Quail	<i>Coturnix coturnix</i>	मोठा लावा
4	Rain Quail	<i>Conturnix coromandelica</i>	शहारे लावा
5	Jungle Bush Quail	<i>Perdicula asiatica</i>	जंगललावा
6	Rock Bush Quail	<i>Perdicula argoondah</i>	खडक्या लावा
7	Common Button Quail	<i>Turnix suscitator</i>	गुंडूरबटलावा
8	Small Button Quail	<i>Turnix sylvatica</i>	सामान्यबटलावा
9	Grey Junglefowl	<i>Gallus sonneratti</i> <i>Temminck</i>	राखीरानकोबडी
10	Red Junglefowl	<i>Gallus gallus</i>	लालरानकोबडा
11	Indian Peafowl	<i>Pavocristatus linnaeus</i>	मोर, लांडोर
Order: ANSERIFORMES: Ducks, Geese			
Family: DENDROCYGNIDAE			
12	Lesser Whistling Duck	<i>Dendrocygna bicolor</i>	अडई
Family: ANATIDAE			
13	Bar-headed Goose	<i>Anser indicus</i>	राजहंस
14	Knob-billed Duck / Comb Duck	<i>Sarkidiomis melanotos</i>	नाकेर
15	Cotton Teal	<i>Nettapus</i> <i>coromandelianus</i>	वणकी
16	Spot-billed Duck	<i>Anas poecilorhyncha</i>	घनवर
17	Brahminy Shelduck	<i>Tadorna ferruginea</i>	चक्रवाक
18	Northern Shoveler	<i>Anas clypeata Linnaeus</i>	परी
19	Northern Pintail	<i>Anas acuta</i>	सरगबाड्डा
20	Mallard	<i>Anus platyrhynchos</i> <i>Linnaeus</i>	गजरा
21	Common Teal	<i>Anas crecca Linnaeus</i>	सुंदर बटवा
22	Red-crested Pochard	<i>Rhodonessa rufia</i>	शेन्द्र्या बाड्डा
23	Common Pochard	<i>Aythya ferina</i>	चिमण शेन्द्र्या

24	Tufted Duck	<i>Athya fuligula</i>	काळा बरडा
Order: PICIFORMES: Woodpeckers, Barbets			
Family: PICIDAE			
25	Yellow-fronted Pied Woodpecker	<i>Dendrocopos mahrattensis</i>	कवड्यासुतार
26	Brown-capped pygmy Woodpecker	<i>Dendrocopos nanus</i>	तपकिरी टोपीचा वामनसुतार
27	Lesser Goldenback	<i>Dinopium benghalense</i>	छोटासोनपाठीसुतार
28	White-naped Woodpecker	<i>Chrysoco laptfestivus</i>	पांढ-यामानेचासुतार
29	Rufous Woodpecker	<i>Celeus drachyurus</i>	उदीसुतार
30	Eurasian Wryneck	<i>Jynx torquilla Linnaeus</i>	मानमोडी
Family: MEGALAIMIDAE			
31	Coppersmith Barbet	<i>Megalaima haemacephala</i>	तांबट
Order: BUCEROTIFORMES: Hornbills			
Family: BUCEROTIDAE			
32	Indian Grey Hornbill	<i>Ocyeros birostris</i>	राखीधनेष
Order: UPEPIFORMES: Hoopoes			
Family: UPUPIDAE			
33	Common Hoopoe	<i>Upupa epops</i>	हुदहुद
Order: CORACIIFORMES: Rollers, Kingfishers, Bee-eaters			
Family: CORACIIDAE			
34	Indian Roller	<i>Coracias benghalensis</i>	भारतीयनिलकंठ
Family: ALCEDINIDAE			
35	Small Blue Kingfisher	<i>Alcedoatthis</i>	छोहा निळ्या खंड्या
Family: HALCYONIDAE			
36	White-breasted Kingfisher	<i>Halcyons smyrnensis</i>	पांढ-याछातीचाखंड्या
37	Stork-billed Kingfisher	<i>Halcyon capensis</i>	घोंगीखंड्या
Family: CERYLIDAE			
38	Lesser Pied Kingfisher	<i>Ceryle rudis</i>	लहान कवड्या खंड्या
Family: MEROPIDAE			
39	Small Bee-eater	<i>Merops orientalis</i>	छोटा पाणपोपट
40	Blue-tailed Bee-eater	<i>Meropsphilippinus pallas</i>	निळ्या शेपटीचा पाणपोपट
41	Chestnut-headed Bee-eater	<i>Merops leschenaultia vieillot</i>	लालशिर पाणपोपट

Order: CUCULIFORMES: Cuckoos			
Family: CUCULIDAE			
42	Pied crested Cuckoo/ Jacobean Cuckoo	<i>Clamator jacobinus</i>	चातक
43	Common Hawk Cuckoo	<i>Hierococcyx varius</i>	पावष्या
44	Indian Cuckoo	<i>Cuculus micropterus</i>	भारतीयकोकीळ
45	Indian Plaintive cuckoo	<i>Cacomantis passerinus</i>	पावश्या
46	Asian Koel	<i>Eudynamys scolopacea</i>	जम्बुद्वीप कोकीळ
47	Sirkeer Malkoha	<i>Taccocua lesschenaultii</i>	सिरकीर मलकोहा
Family: CENTROPODIDAE			
48	Greater Coucal	<i>Centropus (sinensis) parroti</i>	भारद्वाज
Family: PSITTACIDAE			
49	Alexandrine Parakeet	<i>Psittacula eupatria</i>	करणपोपट
50	Rose-ringed Parakeet	<i>Psittacula krameri</i>	चन्ना पोपट
51	Plum-headed Parakeet	<i>Psittacula cyanocephala</i>	टोईपोपट
Order: APODIFORMES: Swifts			
Family: APODIDAE			
52	White-rumped Needletail- swift Spinetail	<i>Zoonavena sylvatica</i>	वनआभोळी
53	House Swift	<i>Apus affinis</i>	गृह आभोळी
54	Asian Palm Swift	<i>Cypsiurus balasiensis</i>	ताडआभोळी
Family: HEMIPROCNIDAE			
55	Crested Tree Swift	<i>Hemiprocnæ coronata</i>	तरू आभोळी
Order: STRIGIFORMES: Owls, Nightjars			
Family: TYTONIDAE			
56	Barn Owl	<i>Tyto alba</i>	कोडीचे घुबड
Family: STRIGIDAE			
57	Collared Scops Owl	<i>Otus bakkamoena</i>	कंठी पिंजरा
58	Indian Eagle-Owl	<i>Bubo bubo</i>	हुमाघुबड
59	Brown Fish-Owl	<i>Ketupaz eylonensis</i>	बदामीमीनखाई घुबड
60	Mottled Wood Owl	<i>Strix ocellata</i>	कबरा वनघुबड
61	Spotted Owlet	<i>Athene brama</i>	ठिपक्यांचा पिंगळा
Family: CAPRIMULGIDAE			
62	Common Indian	<i>Caprimulgus asiaticus</i>	रातवा

	Nightjar		
63	Franklin's Nightjar	<i>Caprimulgus affinis horsfield</i>	फ्रँक्लीनचारातवा
Order: COLUMBIFORMES: Pigeons			
Family: COLUMBIDAE			
64	Blue Rock Pigeon	<i>Columbalivia gmelin</i>	कबूतर
65	Yellow-footed Green Pigeon	<i>Treron phoenicoptera</i>	हारोळी, हरीयाल
66	Eurasian Collared - Dove	<i>Streptopelia decaocto</i>	पिठोळ कवडी
67	Red Collared-Dove	<i>Streptopelia tranquebarica</i>	गेरवी कवडी
68	Spotted Dove	<i>Streptopelia chinensis</i>	चित्रककवडी
69	Little brown dove	<i>Streptopelia senegalensis</i>	लहान कवडी
Order: GRUIFORMES: Cranes, Crakes			
Family: RALLIDAE			
70	Brown Crake	<i>Amauror nisakool</i>	उदी फटाकडी
71	Blue -breasted Rail	<i>Gallirallus striatus</i>	पान कोंबडी
72	White-breasted Waterhen	<i>Amanornis phoenicurus</i>	पांढ-याछातीचीपाणकोंबडी
73	Purple Moorhen	<i>Porphyrio porphyrio</i>	केम
74	Common Moorhen	<i>Gallinula chloropus</i>	काळीपाणकोंबडी
75	Common Coot	<i>Fulica atra Linnaeus</i>	चांदी
Order: CICONIIFORMES			
Family: PTEROCLIDAE			
76	Chestnut-bellied Sandgrouse	<i>Pterocles exustus temminck</i>	भटतितिर
77	Painted Sandgrouse	<i>Pterocles indicus</i>	घोडतितर
Family: SCOLOPACIDAE			
78	Common Snipe	<i>Gallinago gallinago</i>	पाणलावा
79	Common Greenshank	<i>Tringa nebularia</i>	हिरवाटिलवा
80	Common Redshank	<i>Tringa totanus</i>	सामान्यटिलवा
81	Wood Sandpiper	<i>Tringa glareola Linnaeus</i>	वनतुतवार
82	Green Sandpiper	<i>Tringa ochropus</i>	हिरवातुतवार
83	Common Sandpiper	<i>Actities hypoleucos Linnaeus</i>	तुतवार
84	Little Stint	<i>Calidris minuta</i>	लहान टिलवा

85	Sanderling	<i>Calidris alba</i>	पोची
Family: ROSTRATULIDAE			
86	Greater Painted Snipe	<i>Rostratula benghalensis</i>	मोठा भेंडलावा
Family: JACANIDAE			
87	Pheasant-tailed Jacana	<i>Hydrophasianus schirgus</i>	पियू
88	Bronze-winged Jacana	<i>Metopidiu indicus</i>	पाणपिपुली
Family: BURHINIDAE			
89	Great Stone-Curlew	<i>Esacus recurvirostris</i>	मोठा घनचुवा
90	Indian Thick-knee	<i>Burhinus (oedicephalus) indicus</i>	भारतीयकरवानक
Family: CHARADRIIDAE			
91	Black winged Stilt	<i>Himantopus himantopus</i>	घोगर टिलवा
92	Little Ringed Plover	<i>Charadrius dubius Scopoli</i>	कंठीटिटवा
93	Kentish Plover	<i>Charadrius alexandrinus</i>	श्याव टिटवा
94	Yellow-wattled Lapwing	<i>Vanellus malabaricus</i>	पिवळ्या गाठीची टिटवी
95	Red-wattled Lapwing	<i>Vanellus indicus</i>	लाल गाठीची टिटवी
Family: GLAREOLIDAE			
96	Indian Courser	<i>Cursorius coromandelicus</i>	धाविक
97	Small Pratincole	<i>Glareola lactea</i>	छोटाआर्ली
Family: LARIDAE - Gull, Tern			
98	Pallas's Gull	<i>Larus ichthyaetus</i>	पल्लासचची केगो
99	Black-headed Gull	<i>Larus ridibundus Linnaeus</i>	काळशिर केगो
100	River Tern	<i>Sterna aurantia</i>	नदी कुररी
101	Little Tern	<i>Sterna albifrons pallas</i>	चिमण कुररी
Family: ACCIPITRIDAE- Raptors			
102	Osprey	<i>Pandion haliaetus</i>	मीनखाई घार
103	Black-shouldered Kite	<i>Elanus caeruleus</i>	चचाण
104	Black Kite	<i>Milvus migrans</i>	काळी घार
105	Brahminy Kite	<i>Haliastur indus</i>	ब्राम्हणी घार
106	Shikra	<i>Accipiter badius</i>	शिक्रा
107	Besra sparrowhawk	<i>Accipiter virgatus</i>	बेसरा ससाणा

108	Eurasian Sparrowhawk	<i>Accipiter nisus</i>	ससाणा
109	Indian White –backed Vulture	<i>Gyps bengalensis</i>	पांढ-यापाठीचेगिधाड
110	Logh -billed Vulture	<i>Gyps Indicus</i>	लांबचोचीचेगिधाड
111	Red-headed Vulture	<i>Sarcogyps calvus</i>	राजगिधाड
112	Egyptian Vulture	<i>Neophron percnopterus</i>	गिधाडघार
113	Pied Harrier	<i>Circus melanoleucos</i>	अबलकभोवत्या
114	Short-toed Snake Eagle	<i>Circaetus gallicus</i>	पांगुळसर्पगरुड
115	Black Eagle	<i>Ictinaetus malayensis</i>	काळागरुड
116	Steppe Eagle	<i>Aquila nipalensis</i>	नेपाळी गरुड
117	Bonelli's Eagle	<i>Hieraetus fasciatus</i>	मोरघी
118	Grey Headed Fish Eagle	<i>Ichthyophag aichthaetus</i>	राखीडोक्याचामत्स्यगरुड
119	Crested Hawk-Eagle	<i>Nisaetus cirrhatus</i>	तुरेवालागरुड
120	Crested Serpent Eagle	<i>Spilornis cheela</i>	शिखीसर्पगरुड
121	Oriental Honey Buzzard	<i>Pernis ptilorhynchus</i>	मधुबाज
122	White-eyed Buzzard	<i>Butastur teesa</i>	शिंजरतिसा
123	Indian Spotted Eagle	<i>Aquila hastata</i>	भारतीयठिपकेदारगरुड
124	Greater Spotted Eagle	<i>Aquila clanga pallas</i>	ठिपक्याचा पानगरुड
Family: FALCONIDAE			
125	Common Kestrel	<i>Falco tinnunculus</i>	नारझिनक
126	Lesser Kestrel	<i>Falco naumanni</i> <i>Fleisher</i>	चिनीससाणा
Family: PODICIPEDIDAE- Grebes			
127	Little Grebe	<i>Tachybaptus ruficollis</i>	टिबुकली
128	Great Crested Grebe	<i>Podiceps cristatus</i>	मोठीटिबुकली
Family: Anhingidae			
129	Darter	<i>Anhinga melanogaster</i>	करोता
Family: PHALACROCORACIDAE			
130	Little Cormorant	<i>Phalacrocorax niger</i>	लहानपाणकावळा
131	Great Cormorant	<i>Phalacrocorax carbo</i>	मोठापाणकावळा
Family: ARDEIDAE- Egrets, Herons			
132	Median Egret	<i>Egretta garzetta</i>	लहानबगळा
133	Intermediate Egret	<i>Mesophoyx intermedia</i>	मध्यमबगळा
134	Large Egret	<i>Casmerodius albus</i>	मोठाबगळा
135	Cattle Egret	<i>Bubulcus ibis</i>	गायबगळा

136	Grey Heron	<i>Ardea cinerea</i> <i>Linnaeus</i>	राखीकोहकाळ
137	Purple Heron	<i>Ardea purpurea</i> <i>Linnaeus</i>	जांभळाबगळा
138	Striated Heron	<i>Butorides striatus</i>	हिरवीढोकरी
139	Indian Pond Heron	<i>Ardeola grayii</i>	ढोकरी
140	Black crowned night Heron	<i>Nycticorox nycticorax</i>	अंधारी ढोकरी
141	Black Bittern	<i>Dupetor flavcollis</i>	काळी ढोकरी
142	Chestnut Bittern	<i>Ixobrychus</i> <i>cinnamomeus</i>	बेलढोकरी
143	Yellow Bittern	<i>Ixobrychus sinensis</i>	पिवळी ढोकरी
Family: PHOENICOPTERIDAE-Ibis			
144	Glossy Ibis	<i>Plegadis falcinellus</i>	चिमणा कंकर
145	Black Ibis	<i>Pseudibis papillosa</i>	कंकर
146	Black Headed Ibis	<i>Threskiornis</i> <i>melanocephalus</i>	पांढरा
147	Eurasian Spoonbill	<i>Platalea leucorodia</i>	चाटु
Family: CICONIIDAE -Storks			
148	Painted Stork	<i>Myeteria leucocephala</i>	चामठोक
149	Asian Openbill	<i>Anastomus oscitans</i>	घोगल्याफोडा
150	Black Stork	<i>Ciconia nigra</i>	काळा ढोक करकोचा
151	White Necked Stork	<i>Ciconia episcopus</i>	काम-या ढोक
Order: PASSERIFORMES			
Family: PITTIDAEZ			
152	Indian pitta	<i>Pitta brachyura</i>	नवरंग
Family: IRENIDAE			
153	Jerdon's Leafbird	<i>Chloropsis jerdoni</i>	जेरडनचापर्णपक्षी
Family: LANIIDAE			
154	Long-tailed Shrike	<i>Lanius schach</i>	लांबशेपटीचाखाटिक
155	Bay- backed Shrike	<i>Lanius vittatus</i>	उदीपाठीचाखाटिक
156	Southern Grey Shrike	<i>Lanius meridionalis</i> <i>Temminck</i>	भुरा खाटिक
157	Brown Shrike	<i>Lanius cristatus Linnaeus</i>	तपकिरीखाटिक
Family: CORVIDAE			
158	Indian Treepie	<i>Dendrocitta vagabunda</i>	टकाचोर
159	House Crow	<i>Corvus splendens</i>	कावळा
160	Indian Jungle Crow	<i>Corvus (macrorhynchus)</i>	जंगली कावळा

		<i>wagler Culminatus</i>	
161	Eurasian Golden Oriole	<i>Oriolus oriolus</i>	कांचन
162	Black Headed Oriole	<i>Oriolus xanthornus</i>	काळशिर कांचन
163	Large Cuckoo-Shrike	<i>Coracina macei</i>	मोठाकोकीळ- कसाई
164	Scarlet Minivet	<i>Pericrocotus flammeus</i>	नारिगीगोमेट
165	Small Minivet	<i>Pericrocotus cinnamomeus</i>	छोटागोमेट
166	Black Drongo	<i>Dicrurus macrocercus viciuot</i>	काळा कोतवाल
167	Ashy Drongo	<i>Dicrurus leucophaeus</i>	राखीकोतवाल
168	White-bellied Drongo	<i>Dicrurus caerulescens</i>	पांढ-यापोटाचाकोतवाल
169	Greater Racket-tailed Drongo	<i>Dicrurus paradiseus</i>	पल्लवपुच्छकोतवाल
170	White-throated Fantail Flycatcher	<i>Rhipidura albicollis</i>	श्वेतकंठी नाच
171	White-browed Fantail	<i>Rhipidura aureola</i>	सितभ्रूनाचन
172	White-spotted Fantail	<i>Rhipidura albogularis</i>	पांढ-याठिपक्यांचीनाचण
173	Asian Paradise-flycatcher	<i>Terpsiphone paradisi</i>	शाही बुलबुल
174	Common Iora	<i>Aegithina tiphia</i>	चेरोका
175	Common Woodshrike	<i>Tephrodoris pondicerianus</i>	वनकसाई
176	Black-headed Cuckooshrike	<i>Coracina melanoptera</i>	काळसर कोकीळ- कसाई
Family: MUSCICAPIDAE			
177	Blue Rock Thrush	<i>Monticola solitarius</i>	नीलकस्तुरीका
178	Orange-headed Thrush	<i>Zoothera citrina</i>	लालशिर कस्तुरीका
179	Tickell's Blue Flycatcher	<i>Cyornis tickelliae</i>	टिकेलची लिटकुरी
180	Verditer Flycatcher	<i>Eumyias thalassinus</i>	मोरकंठी लिटकुरी
181	Taiga Flycatcher	<i>Ficedula albicilla</i>	तैगामाशीमार
182	Black-naped Monarch	<i>Hypothymis azurea</i>	सगबुलबुल
183	Bluethroat	<i>Luscinia svecica</i>	नीलकंठी
184	Oriental Magpie Robin	<i>Copsychus saularis</i>	दयाळ
185	Indian Robin	<i>Saxicoloides fulicatus</i>	सुई
186	Black Redstart	<i>Phoenicurus ochruros</i>	काळाथिरथिरा
187	Common stone chat	<i>Saxicola torquata</i>	पाषाण मोजा
188	Pied Bush Chat	<i>Saxicola caprata</i>	कबरा मोजा

189	Indian Chat	<i>Cercomela fusca</i>	मोजा
Family: STURNIDAE			
190	Chestnut-tailed Starling	<i>Sturnia malabaricus</i>	बदामीशेपटीचीमैना
191	Brahminy Starling	<i>Sturnus pagodarum</i>	ब्राम्हणी मैना
192	Rosy starling	<i>Sturnus roseus</i>	पडस मैना
193	Asian Pied Starling	<i>Sturnus contra</i>	अबलख मैना
194	Common Myna	<i>Acridotheres tristis</i>	मैना
Family: PARIDAE			
195	Great Tit	<i>Parus major</i>	रामगंगा
Family: DICAIDAE			
196	Thick billed Flowerpecker	<i>Dicaeum agile</i>	जाडचोचीचाफुलटोंच्या
Family: HIRUNDINIDAE			
197	Dusky Crag Martin	<i>Hirundo concolor sykes</i>	धुसरपंकोळी
198	Common Swallow	<i>Hirundo rustica</i>	देवकन्हई
199	Wire-tailed Swallow	<i>Hirundo smithii</i>	काडीवाली देवकन्हई
200	Red-rumped Swallow	<i>Cecropis daurica</i>	लालगुबी देवकन्हई
201	Streak-throated Swallow	<i>Hirundo fluvicola Blyth</i>	रेखीकंठी देवकन्हई
Family: PYCNONOTIDAE			
202	Red Vented Bulbul	<i>Pycnonotus cafer</i>	लालगुबी बुलबुल
203	White-browed Bulbul	<i>Pycnonotus luteolus</i>	खर बुलबुल
Family: CISTICOLIDAE			
204	Zitting Cisticola	<i>Cisticola juncidis</i>	रेशाळ वटवट्या
205	Ashy Prinia	<i>Prinia socialis skyes</i>	राखी वटवट्या
206	Plain Prinia	<i>Prinia inornata skyes</i>	वटवट्या
207	Grey Breasted Prinia	<i>Prinia hodgsonii</i>	राखीछाती वटवट्या
208	Jungle Prinia	<i>Prinia sylvatica Jerdon</i>	रान वटवट्या
Family: ZOSTEROPIDAE			
209	Oriental White-eye	<i>Zosterops palpebrosus</i>	चश्मेवाला
Family: SYLVIIDAE			
210	Blyth's Reed Warbler	<i>Acrocephalus dumetorum</i>	हलीथचा वेणु वटवट्या
211	Clamorous Reed Warbler	<i>Acrocephalus stentoreus Blyth</i>	बडयाबडया बोरु वटवट्या

212	Booted Warbler	<i>Hippolais caligata</i>	वृक्ष वटवटया
213	Greenish Leaf Warbler	<i>Phylloscopus trochiloides</i>	पाचूपणी वटवटया
214	Sulpher-bellied Warbler	<i>Phylloscopus griseolus</i>	पिवळयापोटाचा वटवटया
215	Common Chieffchaf	<i>Phylloscopus collybita</i>	चिपचिप
216	Common Lesser Whitethroat	<i>Sylvia curruca</i>	श्वेतकंठी टावटवटया
217	Common Tailor Bird	<i>Orthobomus sutorius</i>	शीपी
218	Yellow-eyed Babbler	<i>Chrysomm asinense</i>	पिवळया डोळयाचा सातभाई-पिताक्ष सातभाई
219	Common Babbler	<i>Turdoides caudatus</i>	सामान्यसातभाई- सातभाई
220	Large Grey Babbler	<i>Turdoides malcolmi</i>	राखीसातभाई
221	Jungle Babbler	<i>Turdoides striatus</i>	जंगलीसातभाई
222	Rufous-bellied-Babbler	<i>Dumetia hyperythra</i>	तांबूस उदर सातभाई
Family: ALAUDIDAE			
223	Indian Bushlark	<i>Mirafra erythroptera</i>	भारतीयचंडोल
224	Singing Bushlark	<i>Mirafra cantillanus</i>	गायकभट चंडोल
225	Ashy-crowned Sparrow Lark	<i>Eremopterix grisea</i>	चिमण चंडोल
226	Rufous-tailed Finch Lark	<i>Ammomanes phoenicurus</i>	गारली चंडोल
227	Sykes's crested Lark	<i>Galerida deva</i>	तरेबाज चंडोल
228	Common Crested Lark	<i>Galerida cristata</i>	शिखी चंडोल
229	Oriental Skylark	<i>Alauda gulgula</i>	गुलगुलाचंडोल
Family: NECTARINIDAE			
230	Purple-rumped Sunbird	<i>Nectarinia zeylonica</i>	पंचरंगी सुर्यपक्षी
231	Purple Sunbird	<i>Nectarinia asiatica</i>	जांभळासुर्यपक्षी
Family: PASSERIDAE			
232	White Wagtail	<i>Motacilla alba</i>	पांढराधोबी
233	White browed Wagtail	<i>Motacilla maderaspatensis</i>	कवडयाधोबी
234	Yellow Wagtail	<i>Motacilla flava</i>	पिवळाधोबी
235	Grey Wagtail	<i>Motacilla cinerea tunstall</i>	करडाधोबी
236	Citrine Wagtail	<i>Motacilla citreola pallas</i>	पिवळयाडोक्याचाधोबी
237	Paddyfield Pipit	<i>Anthus rufulus</i>	धानचिर चिमणी

238	Blyth's pipit	<i>Anthus godlewskii</i>	ब्लीथचीतिरचिमणी
239	Tawny pipit	<i>Anthus campestris</i>	पिंगलतिरचिमणी
240	House Sparrow	<i>Passer domesticus</i>	चिमणी
241	Chestnut-shouldered Petronia (Yellow throated Sparrow)	<i>Petronia xanthocollis</i>	रानचिमणी/ पीतकंठीचिमणी
242	Baya Weaver	<i>Ploceus philippinus</i>	सुगरण
243	Red Avadavat (Munia)	<i>Amandava amandava</i>	लाल मनोली
244	Indian Silverbill	<i>Euodice malabarica</i>	चांदीचोच मनोली
245	Black headed /Tricoloured Munia	<i>Lonchura malacca</i>	काळ्या डोक्याची मनोली
246	Spotted Munia	<i>Lonchura punctulata</i>	ठिपकेवाली मनोली
247	White-rumped Munia	<i>Lonchura striata</i>	श्वेतगुबी मनोली
Family: FRINGILLIDAE			
248	Common Rosenfinch	<i>Carpodacus erythrinus</i>	गोरली
249	Crested Bunting	<i>Milophus lathami</i>	शिखी रेडवा
250	Black-headed Bunting	<i>Emberiza melanocephala</i>	काळ्या डोक्याची रेडवा
251	Grey-necked Bunting	<i>Emberiza buchanani</i>	करडयामानेचा रेडवा

Apart from the above following birds were said to be found in Gondia as per earlier Working Plan. Sarus Crane is the largest flying bird and Gondia is the last home for sarus crane in Maharashtra.

Sr. No.	Common Name	Zoological Name
1.	Purple wood pigeon	<i>Columba punices</i>
2.	Common Crane	<i>Grus sgrus</i>
3.	Sarus crane	<i>Grus antigone</i>
4.	Brown wood Owl	<i>Strix leptogrammica</i>

IUCN Listed Threatened Birds from Gondia District

A. Reptiles of Gondia District

Sr.No.	Common Name	Latin Name	मराठी नाव	RDB Status
1	Alexandrine Parakeet	<i>Psittaculaeupatria</i>	करण पोपट	NT
2	Great Thick knee	<i>Esacusrecurvirostric</i>	मोठा करवानक	NT
3	River Tern	<i>Sterna aurantia</i>	नदी सूरय	NT

4	White-rumped Vulture	<i>Gyps benghalensis</i>	पांढ-या पाठीचे गिधाड	CR
5	Indian Vulture	<i>Gyps indicus</i>	भारतीय गिधाड	CR
6	Egyptian Vulture	<i>Neophron preceptorus</i>	पांढरे गिधाड	EN
7	Red-headed Vulture	<i>Sarcogyps calvus</i>	राज गिधाड	CR
8	Steppe Eagle	<i>Aquila nipalensis</i>	नेपाळी गरुड	EN
9	Grey-headed Fish Eagle	<i>Icthyaophaga ichhyaetus</i>	राखी डोक्याचा मत्स्य गरुड	NT
10	Indian Spotted Eagle	<i>Aquila hastate</i>	छोटा ठिपकेदार गरुड	VU
11	Oriental Darter	<i>Anhinga melanogaster</i>	तिरंदाज	NT
12	Black-headed Ibis	<i>Treskiomis melanocephalus</i>	पांढरा षराटी	NT
13	Painted Stork	<i>Myeteria leucocephala</i>	रंगीत करकोचा	NT
14	Woolly necked Stork	<i>Ciconia episcopus</i>	पांढ-या मानेचा करकोचा	NT
15	Sarus Crane	<i>Grus antigone</i>	सारस, राम लक्ष्मण	VU

Key: RBD-Red Data Book
VU- Vulnerable
EN- Endangered

CR- Critically Endangered
NT- Near Threatened

C. Reptiles of Gondia District

Sr.No.	Reptillia	Scientific Name
Trionychidae		
1	Softshell Turtle	<i>Lissymis</i>
Geckonidae		
1	Yellow-green House Gecko	<i>Hemidactylus flavivirdis</i>
2	Brook's Gecko	<i>Hemidactylus cf. brooki</i>
3	Bark Gecko	<i>Hemidactylus leschenaultia</i>
4	Square Spotted Gecko	<i>Hemidactylus gracilis</i>
5	Termite Hill Gecko	<i>Hemidactylus triedus</i>
6	Kollegal Ground Gecko	<i>Geckoella kollegalensis</i>
7	Nebulosus Ground Gecko	<i>Geckoella nebulosi</i>
Agamidae		
1	Common Garden Lizard	<i>Calotes versicolor</i>
2	Forest Rock Lizard	<i>Psamophilus blanfordianus</i>

Sr.No.	Reptillia	Scientific Name
3	Fan Throated Lizard	<i>Sitana spinaecephalus</i>
Scincidae		
1	Common Brhamhiny Skink	<i>Eutropis carinata</i>
2	Littile Skink	<i>Eutropis macularia</i>
3	Snake Skink	<i>Lagosoma punctate</i>
4	Gunther's Snake Skink	<i>Lygosoma guntheri</i>
5	Snake Skink	<i>Lygosoma punctate</i>
Lacertidae		
1	Jerdons Snake-eyed Lizard	<i>Ophisops jerdoni</i>
Varanidae		
	Bengal Monitor Lizard	<i>Varanus bengalensis</i>
Chameleonidae		
1	Indian Chameleon Lizard	<i>Chameleon zelanicus</i>
Typhlopidae		
1	Bramhiny Blind Snake	<i>Indotyphlops braminus</i>
2	Beacked Worm Snake	<i>Grypotyphlops acutus</i>
Boidae		
1	Red Sand Boa	<i>Eryx johnii</i>
2	Common Sand Boa	<i>Eryx conicus</i>
Pythoniade		
1	Indian Rock Python	<i>Python molurus</i>
Colubridae		
1	Indian Rat Snake	<i>Ptyas mucosa</i>
2	Common Trinket Snake	<i>Coelognathus helena</i>
3	Common Wolf Snake	<i>Lycodon aulicus</i>
4	Barred Wolf Snake	<i>Lycodon striatus</i>
5	Common Kukari Snake	<i>Oligodon arnensis</i>
6	Russell's Kukari Snake	<i>Oligodon taeniolatus</i>
7	Common Cat Snake	<i>Boiga tristis</i>
8	Forstein's Cat Snake	<i>Boiga forsteni</i>
9	Bronze Back Tree Snake	<i>Dendrelaphis tristis</i>
10	Banded Racer	<i>Argyrogena fasciolata</i>
11	Gunthers racer	<i>Coluber ventromaculatus</i>
12	Green Keelback Snake	<i>Macropistodon plumbicolor</i>

Sr.No.	Reptilia	Scientific Name
13	Buffstriped Keelback	<i>Amphiesma stolatum</i>
14	Checkered Keelback Snake	<i>Xenocrophis piscator</i>
15	Olive Keelback Snake	<i>Antretium nastus</i>
16	Green Vine Snake	<i>Ahaetulla nastus</i>
17	Indian Smooth Snake	<i>Coronella brachyra</i>
18	Indian egg eater snake	<i>Elachistodon westermanni</i>
Elapidae		
1	Spectacled Cobra	<i>Naja naja</i>
2	Common Krait	<i>Bungarus ceruleus</i>
3	Slender Coral Snake	<i>Calliophis melanurus</i>
Viperidae		
1	Saw Scaled Viper	<i>Echis carinata</i>
2	Russell's Viper	<i>Daboia russelli</i>

- 1) Preliminary Survey of Reptile Fauna of Vidhabha Region, Maharashtra, (Central India) Presented By: Parag Dandge & Ashish Tiple.
- 2) The 8th Indian Symposium of Odonatology & Biodiversity 2014 Nagpur.

V. OTHERS

List of Algae, Fungi, Bryophytes, Pteridophytes found in Gondia Forest Division

(As provided by C.J. Patel College of Science, Tiroda)

Sr.No.	Species
1	Algae – Spirogyra, Chara, Oedogonium, Hydrodictyon, Mougotia, Oscillatoria, Nostoc, Naviculla, Scenedesmus, Cosmarium, Pinularia, Cymbella.
2	Fungi – Aspergillus, Chaetomium, Penicillium, Mucor, Rhizopus, Fusarium, Alternaria, Pyricularia, Curvularia, Helminthosporium.
3	Byophytes – Riccia, Notothallus
4	Pteridophytes – Pteris, Nephrolepis, Azolla, Lsoetes.

VI. LIST OF MAPS

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CHAPTER 1

THE TRACT DEALT WITH

1.1: NAME & SITUATION: -

1.1.1: Introduction:- Gondia district was established on 1st May 1999 after the separation from Bhandara district. Gondia district was under the privilege of 'Gond Raja'. The whole area was surrounded by the dense forest. 'Gond ' is the main tribe of this area. According to the book written by Shri R.V. Russel, the main business of the local people was collection and selling of Gum and Lac on which the district takes its name as Gondia. Gondia district lies entirely within the Wainganga basin. Major tributaries of the Wainganga are the Bagh, the Pangoli, Chulband, the Gadhvi, the Sur, the Chandan and the Bawanthadi. The district is traversed West to East in the middle by the Mumbai - Hawrah (South Eastern railway) broad gauge railway line and the Mumbai- Kolkata National Highway No.6. There are two medium irrigation projects, one is built on Bagh river in Sirpur village of Deori tahsil and another one is on Wainganga river in Kawlewada village of Tiroda tahsil.

1.1.2: Gondia division is situated between 20° 39' and 21° 38' North latitude and 79° 27' and 80° 42' East longitude. The forest area of Gondia division occurs in compact blocks and at some places, in scattered patches and almost touch the district boundary except, on the Road and Railway side. The area is bounded by Rajnandgaon district (Chattisgarh) from East, Bhandara district (Tumsar, Sakoli Range) (Maharashtra) from West, Balaghat district (MP) from North and Wadsa, Kurkheda, Bedgaon, Arjuni Morgaon and Bramhapuri Division (Maharashtra) from South.

Table No. 1.1 Boundary of the Gondia Division

S.N.	Direction	Name of Forest Division/ District
1	North	Balaghat district of MP State
2	North & North-East	Chattisgarh State.
3	East	Rajnandgaon district of Chattisgarh State
4	South	Wadsa and Bramhapuri Division
5	West	Bhandara Division.

1.2: CONFIGURATION OF THE GROUND: -

1.2.1: For administrative reasons Gondia district consists of 8 Talukas namely; Tiroda, Gondia, Goregaon, Amgaon, Salekasa, Deori, Sadak-Arjuni and Arjuni-Morgaon. The altitude of the district varies from 310 m to 340 m above the mean sea level. Distance of

Gondia town from Nagpur is 169 kms.

1.2.2: The area is generally undulating and hilly with moderate to steep slopes dissected by meandering streams. This area has varied lithology and intricate geological structure. Tropical sub-humid weathering of crystalline metamorphic and igneous rocks has created highly varied soils. Sihar, Morand, Kardi, and Bhardi are important local soil types.

1.3: GEOLOGY, ROCK AND SOIL: -

1.3.1: Geology Formation: This area is rich in minerals with varied lithology and intricate geological structure. Repeated folding and faulting have complicated the rock structure in the area. The topography is characterised by presence of the lenticular narrow ridges trending in the north-northwest to south-southeast direction with occasional spurs rising to various heights. The oldest rocks are the crystalline complex consisting of granite and granite-gneiss, followed by mica schist, hornblende-schist, quartzite, crystalline limestone, calc-granulite and calciphyre of Sausar series exposed in the northern part of the district. They are usually arranged in continuous parallel bands for many kilometers. The manganese deposits in the form of elongated lenticular bands occur among these gneiss, schist and quartzite. The Sakoli series are exposed as a large triangular outcrop. Two or three sets of faults are common in the main exposures, and are usually indicated by fault breccias. The Dongargarh system consisting of rhyolite, andesite, Dongargarh granites and sandstones occupies 88-kilometer-wide belt in a north-northeast direction. Overlying cuddapahs consist of sandstones, shale, grits in the upper part with alternate bands of quartzite and conglomerates in the lower part. The Gondwana sediments referred as Kamthi series have conglomerates, arkose and sandstone, and are exposed in the Wainganga and the Chulband river sections.

**Table No.1.2: Rock formation in Gondia District
(Source: Geological Survey of India)**

Geological formation	Rock assemblage	Geological Period
Alluvium	Soil, Kankar and Laterite	Recent
Deccan Trap	Volcanic flow with partings of sedimentary rocks like limestone and sandstone	Upper cretaceous Eocene
Granite	Granite, quartzite, amphibolites and granite gneiss	Archean lower proterozoic

1.3.2: Soil and Minerals: The soils of the district are highly varied, arising out of the tropical sub-humid weathering of crystalline metamorphic and igneous rocks. Tropical sub-humid weathering of crystalline metamorphic and igneous rocks has created highly varied

soils. The main types of soils are kali, kankar, sihar, morand, khardi and bardi. Sihar, Morand, Kardi and Bhardi are important local soil types. Sihar is a reddish yellow soil derived from oxidation of crystalline rocks under tropical humid conditions. It cracks very little in the hot climate, and gradually degrades into Kardi, which is dark in colour with considerable lime content. It is generally gravely and shallow. Morand soil is of two types. Morand, I differ from Kanhar, which is very rich alluvial soil by the presence of limestone nodules. Morand II is coarser in texture and consists of a good deal of sand washed down from the sandstone hills. The Bardi is a very poor soil having stones on the surface. Soil erosion is more prominent on slope. In the plains, mostly Sihar and Morand types of soil are found. Both types are light and slightly acidic. The Sihar soils considered suitable for rice cultivation and Morand soil is suited for Jowar, Wheat and Linseed.

The other soils of the district are kachhar, marhani and retari which are found along the river banks. They are all alluvial and differ in value according to the deposits brought down. Kachhar is blackish in colour and contains very little sand. Marhani is red and is much sandier than kachhar. These two soils are good for garden crops. Retari is poor soil and contains almost all sand. Most of the cultivable soils of the district belong to the morand and sihar types, both of which are light and slightly acidic. The sihar soil is best suited for Rice while morand soil is suited to Jowar, Wheat and Linseed. Morand soil is of two types. Morand, I differ from Kanhar, which is very rich alluvial soil by the presence of limestone nodules. Morand II is coarser in texture and consists of a good deal of sand washed down from the sandstone hills. The bardi and khardi soils are very inferior types of sihar-morand and are used for the cultivation of inferior rice and minor millets.

1.3.3: Economic Geology: Of the varied mineral deposits of the district that have been taken up for exploitation by private mining concerns, the following economic minerals are important.

Manganese – The manganese ore belt of Bhandara district is principally made up of intensely deformed and metamorphosed rocks of the Precambrian Sausar series. The most important manganese deposits are associated with a series of rocks known as Gondites. Dongri-Buzurg, Sitasongi and Chikla are the three most important manganese belts and have been taken up for mining.

- i) **Chromites** – It is occurring near Pauni. The chromites occur as several small bands associated with dunite and serpentine surrounded by the country rock granite.

- ii) **Kyanite** – Sillimanite – It occurs in the rocks of Sakoli series. Of these deposits, massive Sillimanite deposits at Pohra and Kainite-Sillimanite deposits at Dahegaon are most important.
- iii) **Corundum** – They have been reported at the foot hill of a small hillock at Pohra.
- iv) **Gold** – Occurrence of gold as placer deposits has been reported around Koka village.
- v) **Radio active minerals** – The occurrence of uranium oxide from granophyres, 5 Kms. NW of Parsori has been reported.
- vi) **Iron ore** – The banded hematite – quartzites and the interbedded purple ferruginous phyllites have given rise to high grade hematite ore in small pockets towards east of Maselli.

Besides the above-mentioned minerals, other minerals' deposits of lesser economic significance include the green mica near Mohalgaon, talc and soap stone in Sakoli tahsil and lead and antimony near Pauni.

1.4: CLIMATIC PARAMETERS:

The climate of Gondia district is hot and dry. There are three seasons namely; cold (winter), hot (summer) and monsoon (rainy). The cold season starts by about the end of November and continues upto middle of February. The cold is mild and the weather is pleasant. The hot season starts by the middle of February till the onset of monsoon in the middle of June. During the months of April and May, the heat of the day is rather unbearable due to hot winds and the dryness of the atmosphere. The monsoon season starts from the middle of June and continues up to first week of October. The monsoon months are sultry. The heat increases as soon as monsoon ends and the months of October and November are mostly uneasy till the winter sets in.

1.4.1: Temperature

The diurnal range of temperature is the largest during March. In August these changes are minimum. In April the maximum temperature goes 45°C, while in May it goes upto 47°C. The shorter divergence is only during the rainy season. The high temperature during the summer months adversely affects the vegetation in flat and bare country. The winter is mild and during December to mid February the minimum temperature varies between 6 -17-degree C. In the forest clad hills, more conditions are favorable to plant growth.

1.4.2: Rainfall

The major portion of the total annual rainfall is received during June to September each year, which generally amounts to 90 percent of the annual rainfall. Normally August is the

heaviest rainfall month. The average annual rainfall of Gondia is around 1200 mm. of late the annual rainfall is showing large variations. The rainfall distribution in a year is also irregular. In the recent past years, there have been erratic rains during the monsoon almost every alternate year. This affects the natural regeneration as well as afforestation works which are being taken on a large scale. Average number of rainy days in a year varies with place. Except the rainy season, the entire year is dry. The variation of the rainfall from 2013-14 year to 2022-23 year is significantly large.

1.4.3: Drought

Damage due to drought is a rare incident. In the recent past, there have been erratic rains during the monsoon. This affects the natural regeneration and afforestation works undertaken in the division.

1.4.4: Storms, Floods and Frost

Winds are generally light to moderate with some increase in wind force during the later part of the summer and monsoon months. During the monsoon, the winds blow mostly from directions between south-west and north-west. In the period from October to February, the winds are mainly northerly to north-easterly in the mornings & north-easterly to easterly in the afternoons. By March, winds from directions between south-west and north-west begin to blow and with the advance of the season they become predominant. Occasional storms in pre-monsoon or monsoon periods are also experienced which result into uprooting of isolated trees. The occurrence of floods is not common.

Frost is almost unknown in the forest areas of the district. Slight damage due to frost in the low-lying areas of present Tiroda range and Nagzira wildlife sanctuary was recorded in 1928- 29 and 1936-37.

1.4.5: Soil Erosion: Soil erosion is noticed all over the forest areas of division. The top layer of soil which stores organic matter, and nutrients, on which plants feed, is lost in this process. It decreases the soil fertility, lower the sub-soil water level and water holding capacity of the soil. Sheet erosion in plains and gully erosion on slopes is moderate in most of the areas of the forest.

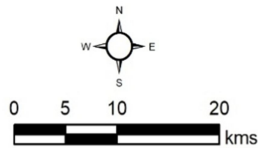
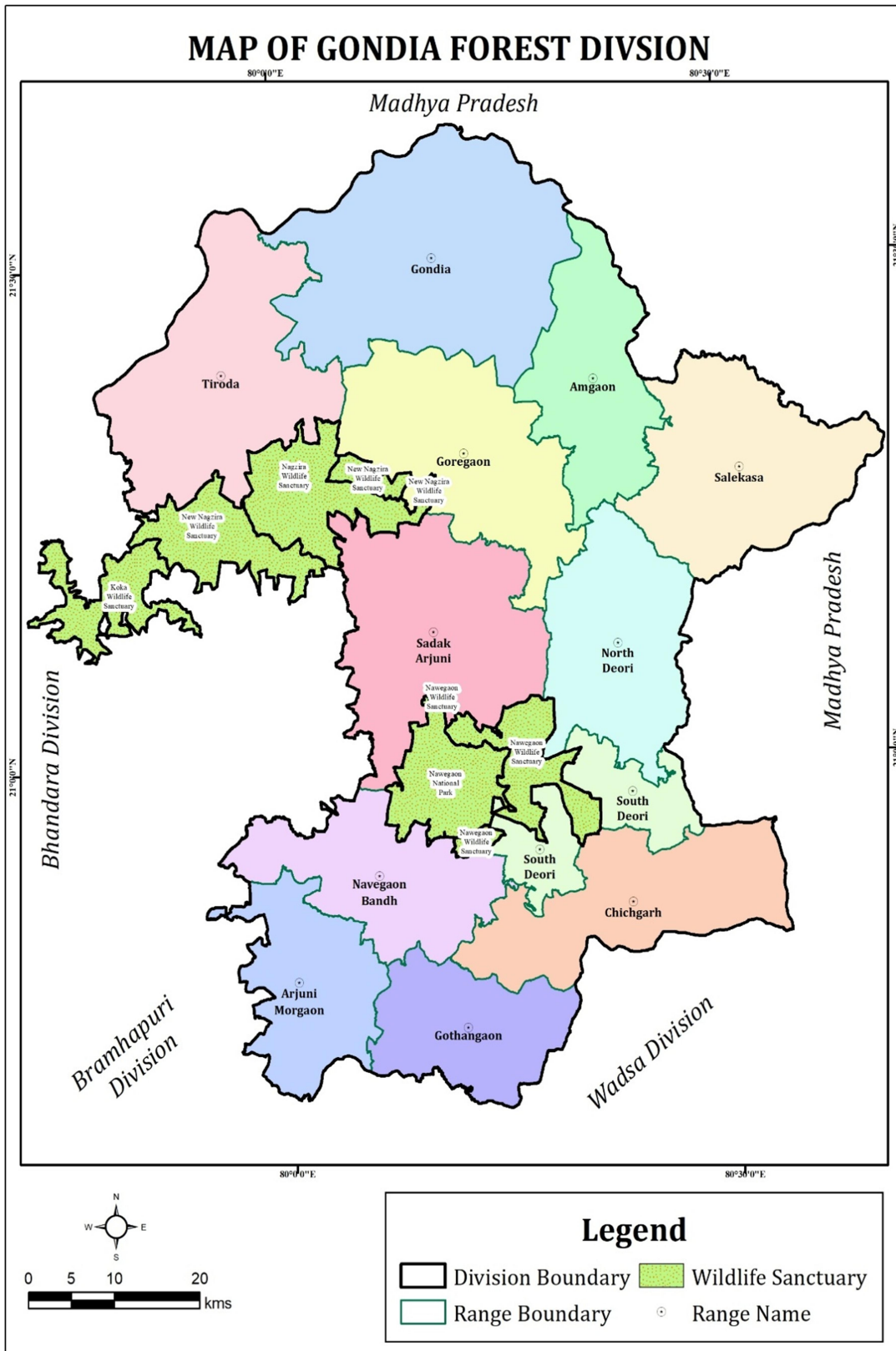
But it is increasing at an alarming rate in forest all over the division. The erosion has increased due to excess harvesting of coupes without soil conservation works in the subsequent year of felling, excessive grazing and repeated fires.

1.4.6: Health: The weather is usually oppressive in summer, very sultry and humid during monsoon. However, during winter it is pleasant. Due to improvement in health services, the epidemics are rare. However, cases of Gastro-enteritis and Malaria occur in remote villages during the monsoon.

1.4.7: Water Supply: The main rivers passing through the division are Kanhan, Chulband, Garvi and Bagh, which are fed by many small ephemeral tributaries. The area has three major irrigation projects, Itiadoh, Sirpur and Kalisarar and seven medium irrigation projects. A large number of big and small tanks are used for irrigation, fisheries and drinking water sources. Sources of drinking water are wells, hand pumps, water supply schemes and a network of canals. Most tanks are shallow and seasonal in nature. Low rainfall years witness acute shortage of water in the area. Scarcity of drinking water during summer is a major problem in many villages. The minor tanks and small tanks are shallow and are mostly seasonal in nature. Seepage at the tank bed and evaporation on surface from these tanks are relatively high and they fail in their water supply during the hot weather or years of low rainfall.

1.4.8: Wells: There are large number of tube wells and hand pumps. The main source of water supply for drinking is through wells, hand pumps and water supply schemes. In summer, shortage of drinking water is felt in many villages, especially in years of low rainfall. During this period drinking water is supplied by tankers and bullock carts to the scarcity villages. Forest department has also constructed wells in the staff colonies, rest houses and nurseries.

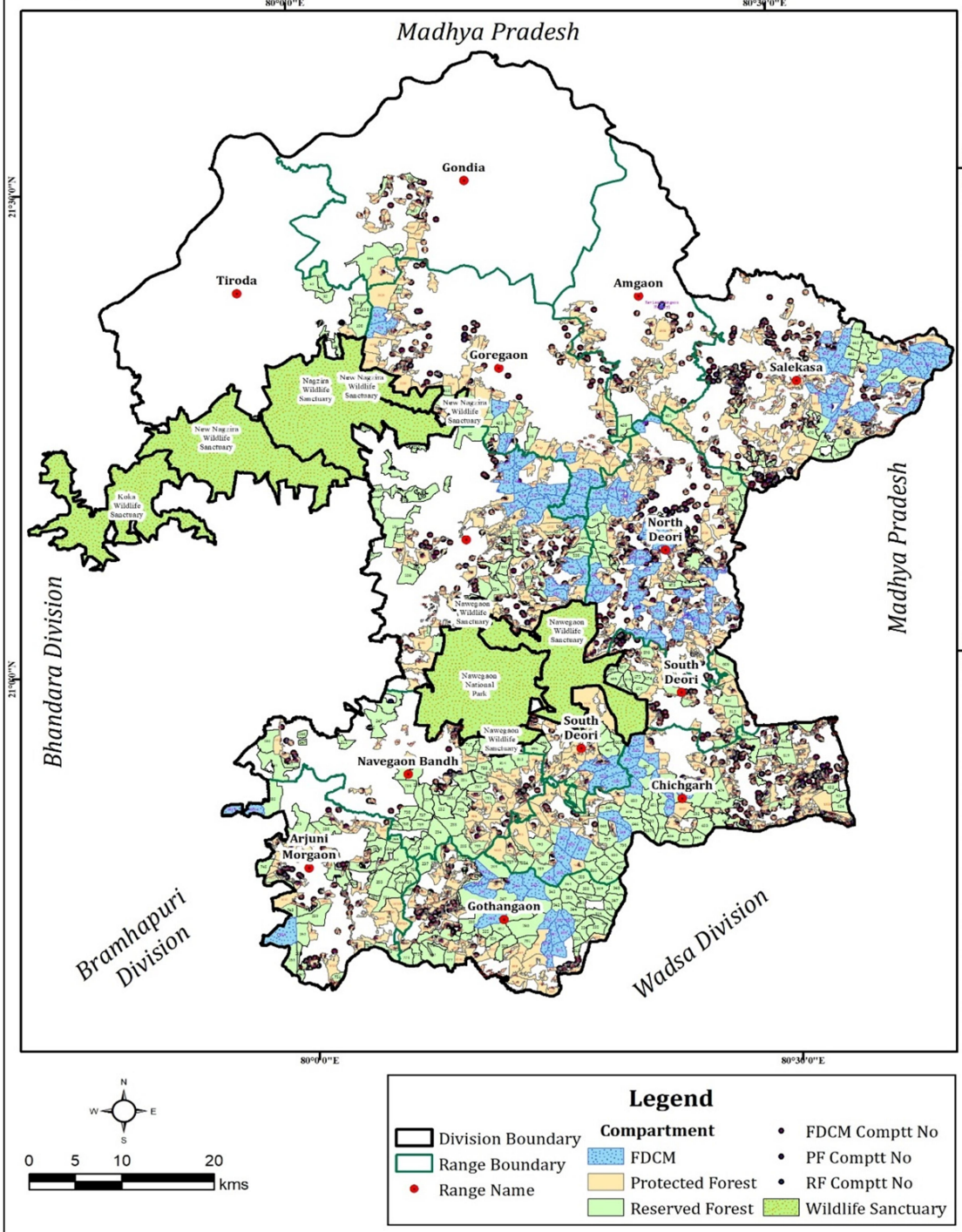
MAP OF GONDIA FOREST DIVISION

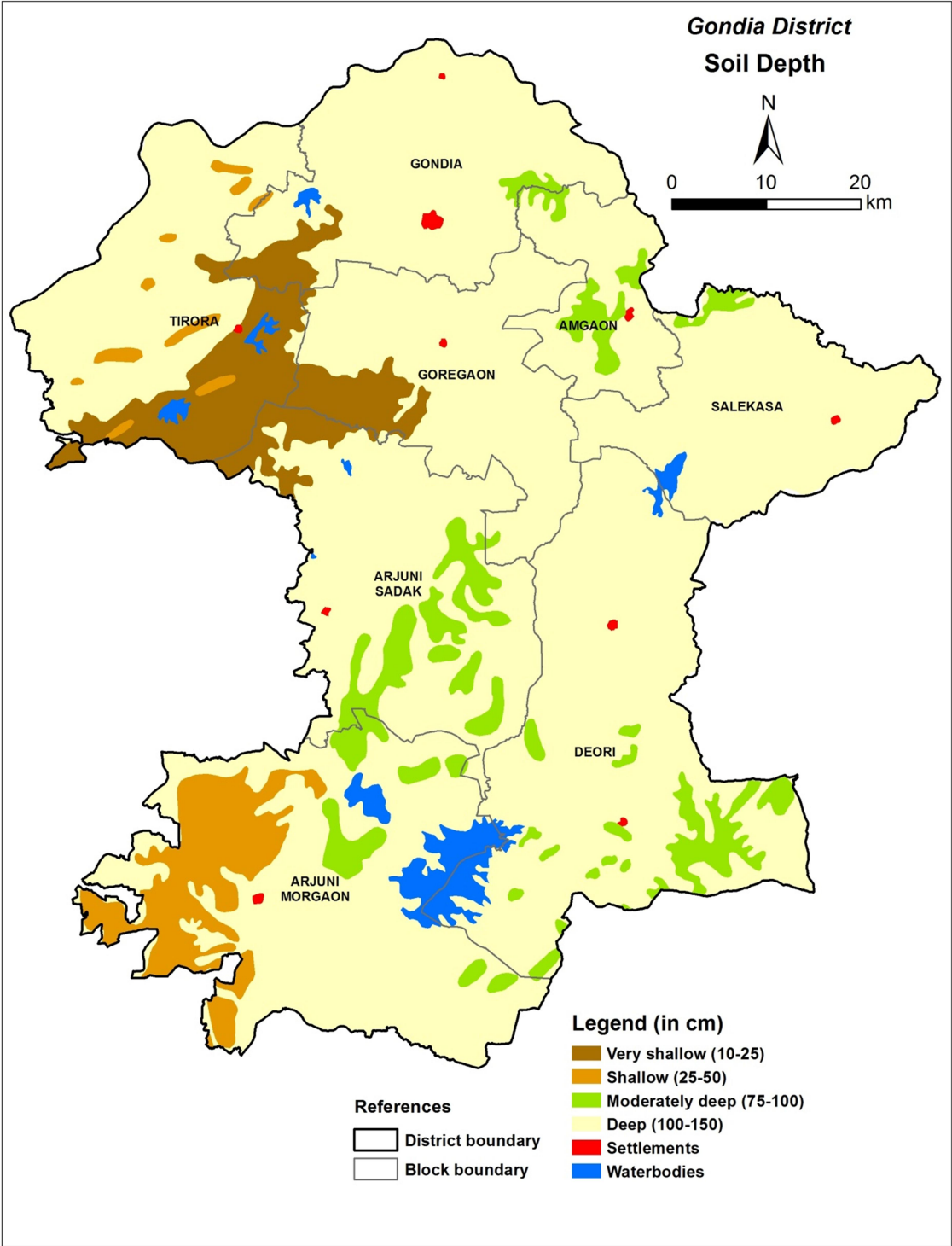


Legend

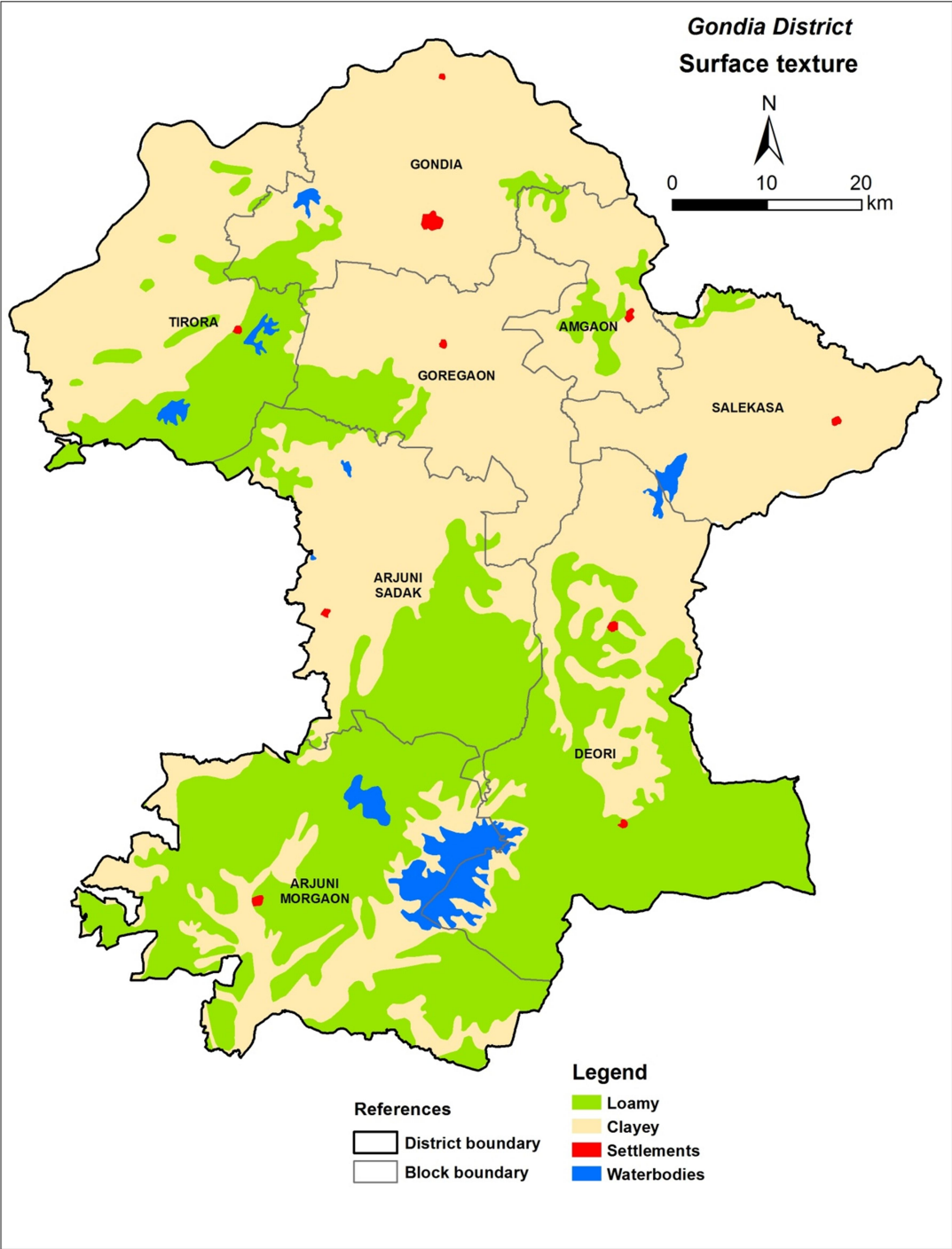
- Division Boundary
- Range Boundary
- Wildlife Sanctuary
- Range Name

Legal Status Wise Forest Area Map of Gondia Forest Division





* This map is provided by National Bureau of Soil Survey and Land Use Planning, Nagpur.



* This map is provided by National Bureau of Soil Survey and Land Use Planning, Nagpur.

CHAPTER 2

MAINTENANCE / INCREASE IN THE EXTENT OF FOREST AND TREE COVER

2.1: AREA OF FORESTS UNDER DIFFERENT LEGAL CLASSES (RF, PF, UF & OTHER)

2.1.1: Area Description

During previous working plan period area of 4422.41 ha. area handed over to Bhandara Forest Division. Thus, the total Forest area of the division excluding FDCM, Nawegaon & Nagzira WLS, New Nawegaon & New Nagzira WLS extends over to 1688.89 Sq. Kms. The area details are summarized in the Table given below:

Table No. 2.1: Total area statement of Gondia division

Sr. no.	Division	Previous plan area in Ha.	Area handed over to Bhandara Forest division in Ha.	Area received by revenue Department dt.13.01.2015 in Ha.	Added After document reconciliation in Ha.	Net Balance area in Gondia forest division in Ha.
1	Gondia	173178.596	(-)4422.41	(+130.500	(+2.46	168889.146

Table No.2.2: Range wise Area Statement of Gondia Division. (in ha.)

Abstract of Gondia Forest Division								
S.N	Name of Range	(RF, NRF, PF, Gose PF, Zudpi Jungle & Unclassed Forest)					Private land taken Over as a Compensatory land under F.C.A.1980 Area in ha.	Total Area in ha.
		RF	PF	Total (RF+PF)	Zudpi Jungle	Unclassed Forest		
		Area in ha.	Area in ha.	Area in ha.	Area in ha.	Area in ha.		
1.	2	3	4	5	6	7	8	9
1	Tiroda	2363.570	3442.387	5805.957	2147.500	0.000	0.000	7953.457
2	Gondia	1267.571	4978.296	6245.867	3338.920	130.500	0.000	9715.287
3	Goregaon	1947.033	7002.587	8949.620	1584.560	2319.499	2.610	12856.289
4	Amgaon	579.100	3038.594	3617.694	2520.860	127.592	0.000	6266.146
5	Salekasa	4206.770	5431.421	9638.191	4691.250	1069.603	8.140	15407.184
6	North Deori	5322.900	8449.016	13771.916	6.060	1011.047	4.980	14794.003
7	South Deori	5085.400	6655.691	11741.091	378.740	0.000	9.420	12129.251
8	Chichgarh	12412.290	10253.22	22665.51	801.800	53.454	0.000	23520.761
9	Sadak Arjuni	7114.862	8764.843	15879.705	1773.350	964.453	0.000	18617.508
10	Nawegaonbandh	10611.907	4832.17	15464.077	1014.500	182.551	0.000	16661.128
11	Gothangaon	11118.100	3752.401	14870.501	1228.740	1381.879	0.000	17481.120
12	Arjuni Morgaon	8447.650	4649.96	13097.61	389.400	0.000	0.000	13487.012
Grand Total		70477.153	71270.585	141747.739	19875.680	7240.578	25.150	168889.146

The area includes NNTR buffer also it will be changed once the area is handed over to NNTR under unified control

2.1.2: Administrative Units:

For administrative convenience the ranges, rounds and beats were reorganized in Gondia Forest Division and the entire division has been divided into 12 ranges, 62 rounds and 294 beats. Range wise distribution of forests is given in **Appendix No. VII.**

2.1.3: Legal Position

Reserved forest: The forest that were originally declared Reserved forests under the provisions of Indian Forest Act VII of 1878, as per the notification No.917(a) dated 26.02.1879 subsequent changes, as effected under the authority of State Government and gazette notifications issued from time to time are incorporated. The rest of the Reserved Forests were declared as RF under section 20 of the Indian Forest Act 1927 by the Government of Maharashtra vide its notifications FLD-3574-53802-F2 dated 7.9.1977, FLD-3575/ 93648/F2 Dated 7.9.1977 and FLD-3570-68426-F2 dated 14.4.1978 and 4422.21ha Zudpi jungle area also declared as Reserve Forest under section 20 of Indian Forest Act-1927, vide notifications no. FLD-34/2019/CR-249/F3, dated 20.03.2019

Protected forest: As per Madhya Pradesh Abolition of Proprietary Rights (Estates, Mahals and Alienated lands) Act of 1950 (I of 1951), the areas formerly belonging to Malguzars were vested in the State Government. On April 1, 1951, they were taken over by the Revenue Department as per the instructions contained in M. P. Revenue Department's Letter No 2249-286-XII dated April 6, 1951 and No 7177-CR-617-XII, dated December 4, 1951. The transfer of these forests to the Department was completed by the year 1954. These forests were then declared as Protected Forests under section 29 of the Indian Forest Act 1927 vide Government of Madhya Pradesh Notification No. 3058-2979-XI dated June 4, 1955.

In exercise of powers conferred by section 30 and 32 of Indian Forest Act, 1927 notifications reserving trees, etc., were issued and rules were framed by the Government of Bombay under FLD-4657/103064-E dated December 19, 1958.

Notification under section 4 of the Indian Forest Act, 1927 were issued in respect of all these forests vide Government of Maharashtra No FLD-1258/II, 3314-E dated May 30, 1959. In 1977 and 1978, Government of Maharashtra declared 44640.839 ha. area of this Protected Forest as Reserved Forest under Section 20 of the Indian Forest Act, 1927, vide notification FLD-3574-53802-F2 dated 07.09.1977, FLD-3575/93648-F2 dated 07.09.1977 and FLD-3570- 68426-F2, dated 14.04.1978.

A number of alteration and adjustments affecting the area of the Reserved and Protected Forest have subsequently taken place. The details of these are recorded in Form No. 1 Total area of 19875.68 ha of Zudpi jungle owned by Revenue department was handed over to the Forest department. The proposal for notification was sent to Government of Maharashtra, notify these lands into Reserve Forest. The notification was awaited. Taluka wise and Range wise Zudpi jungle distribution is shown in the Table below.

Table No.2.3: Zudpi Jangle (Taluka Wise)

Sr. No.	Taluka	Ranges Included	Total Villages	Area in ha.
1	Tiroda	Tiroda	69	2147.500
2	Gondia	Gondia	112	3338.920
3	Goregaon	Goregaon	48	1584.560
4	Amgaon	Amgaon	66	2520.860
5	Salekasa	Salekasa	60	4691.250
6	Deori	North /Sourth Deori & Chichgarh	56	1186.600
7	Sadak Arjuni	Sadak Arjuni	42	1773.350
8	Arjuni Morgaon	Nawegaon Bandh, Gothngaon & Arjuni Morgaon	46	2632.640
Total			499	19875.680

2.1.4: Right and Concession

Reserved Forests

There is no commutation of Nistar or Paidawar in the Gondia Forest Division. Various concessions were granted from time to time to the agriculturist and others by the erstwhile Government of Madhya Pradesh and Government of Maharashtra. The following concessions were permitted in the past.

- Grazing of cattle belonging to the agriculturists of certain villages, in the vicinity of the Reserved Forests, in accordance with, the grazing rules in force.
- Agriculturists of villages in the vicinity of the Reserved Forest are given certain quantity of bamboo and firewood for their bona fide domestic use at concessional rates. None of these concessions was a legal right.

But after the enactment of “The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights), Act 2006” all the rights, recognized under this Act, has to be respected and granted to the eligible person and communities after following all the legal formalities.

Protected Forests

Before the abolition of the proprietary rights all lands belonged to the proprietors. A village administration paper called ‘Wajib-ul-Arz’ was prepared for every settlement; and plots of land were separately recorded, showing the Khasra numbers and area which was set apart for a particular purpose. Under section 202 of the Central Province Land Revenue Act 1917 a provision was also made for punishing the violation of any of these customs. Under the provision of the Madhya Pradesh Abolition of Proprietary Rights (Estates, Mahala, Alienated Lands) Act 1950 (Act I of 1951), all communal and other wastelands became property of the Government while occupied lands continued to be private. In order to distinguish between the rights existing on the government waste lands and on the other land, a provision was made in Madhya Pradesh Land revenue Code, 1957 prescribing the preparation of the Nistar Patrak and Wajib-ul-Arz for every village. The Nistar Patrak deals exclusively with community and customs over private land.

The nistar enquiry had been conducted in Gondia district during the period 1954-56 and all the villages have been covered under it. The nistar officers have formed grazing and nistar zones by clubbing together surplus villages with deficit villages, while self-sufficient villages have been treated as individual zones. Villages assigned to a particular zone can exercise their Nistar rights within that zone.

The classification of the villages into surplus, deficit or self – sufficient for exercise of nistar rights was made on the following basis:

- A village having tree clad area equal to half the occupied area was considered to be self- sufficient.
- A village having tree clad area more than half the occupied area was considered to be surplus village
- A village having tree clad area less than half the occupied area was considered to be a deficit village.

2.2: FOREST AREA UNDER DIFFERENT WORKING CIRCLE/MANAGEMENT PLAN

During previous working plan period area of 4422.41 ha. has handed over to Bhandara Forest Division table no. 2.2.1 show the working circle wise area handed over to Bhandara Forest Division. This working plan is prepared for an 168889.146 ha. This area under the different working circles in the division is given in the following tables.

Table No.2.4: Working Circle Wise Area Handed Over to Bhandara Forest Division

Sr.No	Working Circle	As per old Working Plan in Ha	Area handed over to Bhandara Forest division in Ha	Area received from revenue Department dt.13.01.2015 in Ha	Added After document reconciliation in Ha	Total Area in Ha
1	SCI WC	63396.438	834.470	0.000	0.000	62561.968
2	IWC	22737.188	2757.930	0.000	0.000	22648.129
3	AFF WC	37132.424	384.860	0.000	0.000	34078.69
4	PWC	11763.778	445.150	0.000	0.000	11318.62
5	MISC WC	38148.768	0.000	130.500	2.460	38281.72
Total Area		173178.596	(-)4422.41	(+)130.500	(+)2.460	168889.146

Table No.2.5: Area Allocation to Different Working Circles

Sr. No.	Name of working Circle	Area allocated(ha)	Percentage of Area
1	Selection –Cum- Improvement	62561.968	37.043%
2	Improvement Working Circle	22648.129	13.410%
3	Afforestation Working Circle	34078.693	20.178%
4	Protection Working Circle	11318.628	6.702%
5	Miscellaneous Working Circle	38281.728	22.667%
6	Wildlife (Overlapping) Working Circle	Entire Area	-----
7	Bamboo (Overlapping) Working Circle	33371.918	-----
8	NTFP (Overlapping) Working Circle	Entire Area	-----
9	JFM (Overlapping) Working Circle	55037.566	-----

2.2.1: Range wise allocation of the area of different working circles are shown in the table below:

Table No.2.6: Range wise Area Allocation of Different Working Circles

Sr. No	Range	Total area in ha.					
		SCI	IWC	AFF	PWC	MISC. WC	Total
1	Tiroda	1690.145	3008.023	664.344	0.000	2590.945	7953.457
2	Gondia	2472.606	140.400	2969.761	0.000	4132.520	9715.287
3	Goregaon	4055.698	1312.220	4402.411	0.000	3085.960	12856.289
4	Amgaon	0.000	808.656	2809.038	0.000	2648.452	6266.146
5	Salekasa	4782.901	2163.555	1997.990	693.745	5768.993	15407.184
6	North Deori	4141.163	3481.315	3665.958	386.500	3119.067	14794.003
7	South Deori	5995.758	1839.606	513.106	2140.027	1640.754	12129.251
8	Chichgarth	12248.822	1288.074	1650.466	3428.721	4904.678	23520.761
9	Sadak Arjuni	5858.303	1270.953	7109.333	2605.571	1773.350	18617.508
10	Nawegaon bandh	6667.937	2022.520	1202.609	344.703	6423.359	16661.128
11	Gothangaon	10145.558	3093.880	2437.432	0.000	1804.250	17481.120
12	Arjuni Morgaon	4503.077	2218.927	4656.247	1719.361	389.400	13487.012
Grand Total		62561.698	22648.129	34078.695	11318.628	38281.728	168889.146

2.3: PERCENTAGES OF FOREST WITH SECURED BOUNDARIES**2.3.1: State of Boundaries**

Approximately the total length of external boundary of the Reserved Forest is 1121km, of which about 144 km is formed by permanent natural features and 860 km is demarcated artificially and a total number of 5687 pillars are used for the purpose. Artificial boundaries are 12m wide cleaned lines with numbered pillars at suitable intervals. Each pillar is surrounded by cairn of stones or earth and is placed in the middle of the 12 m wide boundary line. The pillars are serially numbered in anti-clock-wise direction. Separate series of numbers are given for boundary lines passing through different villages. Half width of the boundary line lies in the Reserved Forest adjoining the Protected Forest. While the whole width line lies within the Reserved Forest, where the reserved forest adjoins the other areas. Although boundary of the Forest Blocks can be ascertained relatively easily on the ground, the artificial boundaries of the Reserved Forests formed in 1977 and 1978 and the Protected Forests are not properly demarcated.

The approximate length of the boundary line of Protected Forest is 705 km of which about 105 km is formed by natural features and 600 km is demarcated artificially. The Protected Forest at some places is in small patches and it traverses along with reserved forest. At the time of transfer of ex-proprietary forest to the Forest department, no demarcation was done on the ground. The survey and demarcation of these forest was started in 1960-61, under the scheme “survey and demarcation of ex- proprietary forests.” The demarcation was done

by pillars. But these pillars were not maintained further due to which these pillars are not traceable on site. In the year 1987-88, TCM were taken in the protected forests, under EGS, to provide work to the labourers due to scarcity. But they were taken as per the demand of labourers and many work remained incomplete due to encroachment problems and non-availability of labour.

The instructions issued by Principal Chief Conservator of Forests, Maharashtra State Nagpur in the year 1987-88, for demarcation in the Protected Forest and Zudpi jungle land handed over to the Forest department; from the revenue department and accordingly works were carried out to some extent the proposal of final notification for reservation of this land under Section 20 of Indian Forest Act, 1927 has already been submitted to the Forest Settlement officer, Nagpur. Therefore, a time bound scheme for demarcation needs to be prepared and implemented on top priority to protect it from further encroachment. A Statement showing the extent of natural and artificial boundaries is given in **Appendix No. XIV.**

Thus, RF, PF & Zudpi Jungle Boundaries are not truly demarcated or secured with pillars.

2.4: LAND USE, LAND USE CHANGE AND FORESTRY (LULUCF)

The total geographical area of the district is 5234 Sq. km of which 1688.89 Sq.Km. is under forest. The condition of the forests and forest cover over the last decade during the implementation of the Plan based on the FSI satellite data is as follows:

Table No. 2.7: Forest Cover of Gondia district over the Last Decade during the Implementation of the plan

ISFR Year	Geographical area (Sq. Km)	VDF (Sq. Km)	MDF (Sq. Km)	OF (Sq. Km)	Total (Sq. Km)	% of Geographical area	Scrub (Sq. Km)	Change w.r.t. earlier report
2017	5234	892	733	298	1923	36.74	30	-5
2019	5234	888.61	732.23	717.75	1938.92	37.04	32.25	15.59
2021	5234	895.40	739.26	310.95	1945.61	37.17	27.18	7.20
2023	5234	962.58	662.20	279.03	1903.81	36.37	22.94	3.40

From analysis of above data, there is increase in forest cover of Gondia district only in VDF category but decrease in MDF, OF and Scrub area. As per ISFR 2023 report there is continuous decrease in forest cover. After analysis the changes in forest cover as compare to 2017, there is increase in total forest cover, but decrease in VDF. There is sudden increase in OF, but in 2021 there is again decrease in OF. In ISFR, Forest cover change matrix inside RFA and outside RFA has been given only for State of Maharashtra.

The threats to the forests from land use and land use change and forestry (LULUCF) is real and affects some areas as pressure on land for habitation, agriculture, industries, development works and other activities mount up as the population increases and the accompanying wants expand.

2.4.1: Disforestation Prior to 1980

Total area of 10108.13 ha has been disforested in Gondia division and transferred to Revenue department prior to 1980. Out of 3842.008 ha area belongs to Reserved Forests & 6266.121 ha belongs to Protected Forest. **(Appendix No. XI)**

2.4.2: Area Diverted for Non-Forestry Purpose under Forest Conservation Act 1980

Forest areas diverted for non-forestry purposes under Forest (Conservation) Act 1980 is 2138.91 ha for 92 projects **(Appendix No. X)**.

In lieu of this land has been made available to the division from various project authorities and revenue department in Gondia Division. The details are given in **(Appendix No. XV & XVI)**

2.4.3: Rights recognized under Scheduled Tribes and Other Traditional Forest Dwellers Act 2006 (FRA)

Under Section 3(2) of FRA, **58.477** ha. involving **135** case has been recognized for Non – Forestry purpose. The status of Implementation of FRA 2006 in Gondia Forest Division (up to May, 2022) is as below.

Table No. 2.8: The Status of Implementation of FRA 2006 in Gondia Forest Division (till 2022-23)

Type of Claim	No.of case received by Gram	No.of cases rejected by Gram Sabha	No.of cases rejected by SDLC	No. of cases rejected by DLC	No.of cases finally accepted by DLC	No.of cases pending for decision by DLC	Accepted cases area in ha.
Individual	21739	5429	6562	1258	9342	1575	5214.88
Community	1357	59	99	0	869	233	40523.88
Total	23096	5488	6661	1258	10211	1808	45738.76

This diversion of forest land to the traditional forest dwellers has further fragmented the area of the Division. These 9342 cases of individual claims distributed cover an area of 5214.88 ha and the 869 claims of community rights cover an area of 40523.88 ha.

2.5: THREATS TO THE FOREST

The main threat to the maintenance of forest cover/area in the Division is encroachment. While the Division is relatively better as compared to the other areas, the propensity of people to colonise on forest land is a common obsession. The Department has also been handed over with 19875.680 ha of Zudpi Jungle and some of the area is already encroached. The area is subject to further encroachment as the consolidation of boundary is not done yet. Hence consolidation of boundary has been given highest priority for Zudpi Jungle which is proposed to be done in 4 years. The threat to the Zudpi Jungle area is also from the fact that at times each survey number being small and scattered rendering the whole area prone to all forms of human interference and exploitation.

2.6: DISTRIBUTION OF DIFFERENT FOREST TYPE

The forests of the Gondia division consists of the Sub group 5A-Tropical Dry Deciduous Forests of Champion and Seth's classification. Edaphic factors, such as topography and past management cause local variations. Composition and quality of the crop vary according to the soil type and soil depth. Excessive grazing and exploitation of forest; and frequent fires have further degraded the forest in many areas and also seriously damaged the natural regeneration of tree species. Garari (*Cleistanthus collinus*) is the most common species in the middle storey in the forest. Association of Garari and Dhaora is quite rare.

2.7: TREES OUTSIDE FORESTS

The total geographical area of the Gondia District is 5234.00 sq. km of which 1903.81 sq. km is forest cover.

The tree outside forests in the state of Maharashtra has not been assessed yet as per the requirement of the Code and as carried out by the Forest Survey of India. However, the Social Forestry Wing of the State has assessed the trees that are available from the years of plantation that it has carried out in the district which form a substantial quantity and forest cover in the areas outside forests.

Trees Outside Forests planted under Social Forestry Gondia Division during the period 2013 to 2022

A) Block Plantation

1. Total beneficiaries-	4025
2. Total planted area -	808.72 ha.
3. Total No. of seedlings planted-	1126500

B) Road-side Plantation

5. Total length planted in km. -	989.15 km.
6. Total No. of seedling, planted -	1025500

Hence, the total no. of plants at the time of handing over the scheme is **1296250** (**732225 + 564025**) and the survival percentage is **60.23%**. The assessment of the survival as on date is required to be carried out.

CHAPTER 3

MAINTENANCE, CONSERVATION AND ENHANCEMENT OF BIODIVERSITY

3.1: FOREST COMPOSITION AND DISTRIBUTION

The forests of the Gondia division consists of the Sub group 5A-Tropical Dry Deciduous Forests of Champion and Seth's classification. Edaphic factors, such as topography and past management cause local variations. Composition and quality of the crop vary according to the soil type and soil depth. Excessive grazing and exploitation of forest; and frequent fires have further degraded the forest in many areas and also seriously damaged the natural regeneration of tree species.

Table 3.1: Forest types in the Gondia Division (*Champion and Seth's classification*)

Type Notation	Notation	Type description
Group 5		Tropical Dry Deciduous Forests
Sub-group 5 A		Southern Tropical Dry Deciduous Forests.
Climate types	5A/ci 5A/cia 5A/cib	Dry teak bearing forests Very dry teak forest Dry teak forest.
	5A/c3	Southern dry mixed deciduous forests
Local subtypes		1. Superior Quality Mixed Forests 2. Medium Quality Mixed Forests 3. Poor Quality Mixed Forests

3.1.1: Teak & Rock

Teak is present in almost all ranges with varying degrees, but in some patches of Deori, Chichgad, Goregaon Ranges, it forms a pure crop. Saja is the predominant species in the mixed forest types. Its important associates are Bija, Dhaoda, Surya and Garadi. Density of the mixed forest varies from blank patches to 0.8 Natural regeneration of almost all species is found but is far from adequate and varies from place depending upon the intensity of fire and grazing damage.

This area is rich in minerals with varied lithology and intricate geological structure. Repeated folding and faulting have complicated the rock structure in the area. The topography is characterized by presence of the lenticular narrow ridges trending in the north-northwest to south-southeast direction with occasional spurs rising to various heights. The oldest rocks are

the crystalline complex consisting of granite and granite-gneiss, followed by mica schist, hornblende-schist, quartzite, crystalline limestone, calc-granulite and calciphyre of Sausar series exposed in the northern part of the district. They are usually arranged in continuous parallel bands for many kilometers. The manganese deposits in the form of elongated lenticular bands occur among these gneiss, schist and quartzite.

The Dongargarh system consisting of rhyolite, andesite, Dongargarh granites and sandstones occupies 88-kilometer-wide belt in a north-northeast direction. Overlying cuddapahs consist of sandstones, shale, grits in the upper part with alternate bands of quartzite and conglomerates in the lower part. The Gondwana sediments referred as Kamthi series have conglomerates, arkose and sandstone, and are exposed in the Wainganga and the Chulband river sections.

3.1.2: A) Dry Teak Bearing Forests

These forests are characterized by the presence of Teak (*Tectona grandis*) in the crop in varying proportions. The composition of the other species in these forests is the same as that of the forests of 5A/c3 category described in the following paragraph. This type of forests can be seen in the Rajoli and the Deori ranges as well as in a few pockets of the Protected Forests. Most of the old teak plantations also fall in such areas. Proportion of Teak is high in areas of alluvial soils along the streams and soils derived from phyllites and quartzite. Its percentage on other rock formations is much lower.

B) Southern Dry Mixed Deciduous Forest

The major portion of the forest of Gondia Division comes under this category. The forests are more or less leafless in hot season and are rich in grasses. Stream banks and lower hill slopes have good quality forests due to rich and deep alluvial soil. Climbers are abundant in good areas. However, forest is of poor quality on the steep slopes and poorly drained soils. Bamboo (*Dendrocalamus strictus*) is distributed unevenly in the division with exception of the Gondia and the Amgaon Range. Bamboo Plantation have made up satisfactorily at many places but lack of proper management of these plantations have made these clumps very congested leading to deterioration of the crop. Grass is conspicuous in open and degraded areas. Saja or Ain (*Terminalia alata*) is the predominant species, and its major associates are Bija (*Pterocarpus marsupium*), Dhaora (*Anogeissus latifolia*), Garari (*Cleisthanthus collinus*) and Lendia (*Lagerstromia parviflora*). Major area falls in the teak site quality III and IVa. Patches of quality II crops are found mainly in the moist deep soils in valleys and along the streams intermixed with quality III crops. Quality IVa is common on eroded and calcareous

soils. The crop varies open to 0.8 in crown density, and middle-aged to mature in the age. Natural regeneration of Ain, Dhaora, Tendu, Bija, Lendia and Garari is better than of Teak. Promising regeneration of teak in open areas is seen in a few pockets. Young regeneration of major species suffers from biotic interference like heavy grazing and frequent fires.

Following species are found in the top storey of the forests: *Terminalia alata* (f), *Pterocarpus marsupium* (f), *Anogeissus latifolia* (f), *Lagerstroemia parviflora* (f), Mokha (*Schrebera Swietenoides*) (f), Dhoban (*Dalbergia paniculata*) (f), Behada (*Terminalia bellerica*) (f), Surya (*Xylia xylocarpa*) (lf), Bhirra (*Chloroxylon swietenia*) (c), Mowai (*Laennia coromandalica*) (c), Kalam (*Mitragyna parviflora*) (lc), Shivan (*Gmelina arborea*) (o), Bhilawa Bibba (*Semicarpus anacardium*) (o), Salai (*Boswellia serrata*) (o), Semal (*Bombax ceiba*) (o), Tiwas (*Ougenia oogenensis*) (o), Moha (*Madhuca longifolia*) (o), Kusum (*Schleichera oleosa*) (o), Bhorsal (*Hymenodictyon excelsum*) (o), Chichwa (*Albizia odorotissima*) (o), Rohan (*Soymida febrifuga*) (o), Kasai (*Bridelia retusa*) (q), Arjun (*Terminalia arjuna*) (r), Kulu (*Sterculia urens*) (r), Haldu (*haldina cordifolia*) (r), Shisham (*Dalbergia latifolia*) (r), etc.

Species seen in the middle storey includes *Cleistanthus collinus* (a), Tendu (*Diospyros melanoxylon*) (f), Palas (*Butea monosperma*) (lc), Char (*Buchnanania lanzan*) (o), Dhaman (*Grewia tilifolia*) (o), Gongal (*Cochlospermum religiosum*) (o), Amaltas (*Cassia fistula*) (o), Apta (*Bauhinia racemosa*) (o), Ghoghar (*Gardenia latifolia*) (o), Aonla (*Phyllanthus emblica*) (f), Bor (*Zizyphus* spp.) (c), Lokhandi (*Ixora arborea*) (o) and Tondri (*Caeseria tomentosa*) (o). Khair (*Acacia catechu*) is locally frequent mainly on shallow and rocky sites Bans (*Dendrocalamus strictus*) is found in the entire division except in the Gondia and the Amgaon ranges. Katang bamboo (*Bambusa arundinacea*) is restricted to a few patches along streams. Bamboo plantations of *Dendrocalamus strictus* have been raised successfully in the past. Natural regeneration of bamboo was noticed in compartment 352 near Nagandoh. However, the bamboo area generally appears shrinking in extent. Improper exploitation of bamboo in the past has resulted in deterioration of clumps.

C) Dry Deciduous Shrub

Shrubs found in these forests are Bharati (*Maytenus emarginatus*) (a), Nirguli (*Vitex negundo*) (f), Kharata (*Dodonea viscosa*) (lc), Dikamali (*Gardenia resinifera*) (o), Kuda (*Holorrhena pubescense*) (o), Jilbili (*Woodfordia fruticosa*) (o), Dudhi (*Wrightia tinctoria*) (o), Muradsheng (*Helicteres isora*) (o), Neel (*Indigofera tinctoria*) (o), Phetra (*Gardenia turgiola*) (o), and Katumber (*Ficus hispida*) (r), Chilati (*Mimosa hamata*) (c), Eruni (*Zizyphus*

oenopila) (c), Kukudranji (*Calycopteris floribunda*) (1a), Mahulbel (*Bauhinia vahil*) (1c), Aradphari (*Olex scandes*) (o), Palasvel (*Butea superba*) (o), Bokadvel or Nagvel (*Cryptolepis buchanani*) (o) and Gunj (*Abunus preicatorius*) (o) are climbers generally noticed in the forests. *Loranthus longiflorus* (o) is a common tree parasite. Tarota (*Cassia tora*) is among the most abundant herbs in the area. Common grasses include, Kusal (*Heteropogan contortus*) (a), Bhurbhusi (*Eragrostic tenella*) (c), Dab or Dabat (*Imperata cylindrical*) (1a), Khas (*Veteveria zizaniodes*) (1c), Mushan (*Iseilema laxum*) (o), Phulkia (*Apluda mutica*) (o), Ghonad (*Themeda quadrivalvis*) (o) and Sheda (*Sehima nervosum*) (r).

(D) Superior Quality Mixed Forests

This sub type is generally found in the valleys, lower gental slopes of hills as well as in the deep alluvial soil along the streams. The site quality is predominantly III with some areas under II. The crop is mainly middle – aged to mature. Saja and Bija constitute more than one – third of the crop in the “Saja- Bija sub type.” Saja is the predominant species, and other associate species are Bija, Dhaora, Surya, Tendu, Kalam and Garadi. This subtype is found along the Nishani nala and in parts of Pratapgarh, Rajoli, Deori, Salekasa and Chichgarh range. In the “Without Saja – Bija subtype,” proportion of Saja and Bija is less than one third of the crop composition. Occasionally Surya and Dhaora become prominent in the crop.

(E) Medium Quality mixed forests

The forests of this type belong to quality III to IVa, and can be classified into the Saja-Bija, the Garari and the Salai subtypes based on the composition.

1. Saja and Bija constitute more than one third of the crop in the “Saja- Bija sub type.”
The forest soil in the subtype is generally medium to fairly good in depth, and hence, supports good density varying from 0.4 to 0.6. Associate species are Dhaora, Lendia, Tendu, Moha, Aonla, Palas and Muntil Kalam dhar. It is not uncommon to find high proportion of Garari in the lower storey with Saja and Bija in the top storey. Regeneration of Saja is profuse at many places.
2. Garari is the predominant species, the Garari subtype found in plains to undulating parts in Deori, Khadi and Dighori areas. The Site Quality is mainly IVa tending to IVb. The other major species found in this subtype in the lower storey are Dhaora, Moha, Mundi, Tendu, Salai, Tinsa, Amta and Koilar. Coppicing power of Garari is so high that it doninates areas where Saja and Bija felled previously. Lack of tending in the Teak plantations resulted in high percentage of Garari suppressing Teak. chikti
3. The Salai subtype is mainly the degradation subtype on the upper slopes and on arid

soils. The density varies from 0.3 to 0.5, and usual associates are Bhira, Mowai, kulu, Tendu and Khair. This sub type is found in compartment 176, and in Dhivrintola, Fukimeta and adjoining areas.

(F) Poor Quality Mixed Forest

The forest falling in this type are mostly of site quality Iva and IVb with the dominance of Rohan or Khair depending upon the soil conditions. Forest with Rohan are often found on scattered patches of calcareous soils, and have Rohan as the main species. The undergrowth comprises of Dikamali, kurmudi and Jhibili. Forest with Khair are found on arid and rocky patches on the hill slopes of Deori, Dighori and Gawarra areas, and are seen merging with Salai. Lendia and Dhaora are common associates.

3.2: PLANT SPECIES DIVERSITY

The floral diversity of the Division is given in the page xxiii to xxix of Introduction. The list consists of 79 types of trees, 16 types of shrubs, 23 types of herbs, 18 types of bamboo and grass and 18 types of climbers. There are 64 species of medicinal plants in the forests. Few species of Algae, fungi etc present in the district were also given in the Plan based on information received from the local Institutions. The list is evidently not exhaustive and inadequate for the purpose of identifying the expanse of species diversity of the plant kingdom existing in the Division.

3.3: STATUS OF BIODIVERSITY CONSERVATION IN FOREST

The forests of Gondia are rich in Biodiversity and areas close to the Nawegaon & Nagzira Wildlife Sanctuary are particularly noteworthy. However, in view of the presence of large areas under teak, the repeated fires over the years, preferential treatment to commercial species; the enhancement of biodiversity in the forests as a whole need to be addressed.

The plant diversity and faunal richness of the area needs to be maintained and enhanced with sincere effort of the Department, the help of the public, the initiative for formation of Biodiversity Committees, reducing the threats to the wildlife etc.

Among the important Schedule I species found in the area of the Division are Tiger, Panther, Leopard cat, Indian White Backed vulture and Peafowl.

Biological Diversity Act, 2002 focuses on conservation biological diversity, its sustainable use and the fair sharing of benefits from its use with local communities. In Gondia Forest Division, Forest Department has set up Biodiversity Management committees (BMCs) in Gram Panchayats. Purpose of these committees is to record the indigeneous knowledge

systems existing among the local community to have access sharing benefits for the active conservation efforts made by forest dependent communities.

3.4: STATUS OF SPECIES PRONE TO OVER EXPLOITATION

The status of species prone to over exploitation in the Gondia forest area needs to be studied with the help of scientific organisation like ICFRE, IIFM, Bhopal and TFRI, Jabalpur etc. However, from the information derived through discussion in the field with the forest officers and field staffs few species like Mahua for flowers, Kulu, Dhaoda and Saja for gums are over exploited from the forest area.

3.5: CONSERVATION OF GENETIC RESOURCES

The Genetic resource of the forests is an invaluable asset that needs to be studied in detail. The documentation of the flora and the fauna of the Division should be taken at the earliest with the help of experts in the field. The Research Wing of the Department needs to identify areas of high biodiversity in collaboration with the Territorial Wing and to carry out research and documentation of the species available.

- (1) As per information received from DFO Silviculture Nagpur Preservation and seed plots situated in Gondia forest division are as under.

Table No. 3.2: Preservation & Seed Plot Situated in Gondia Forest Division

Division	Comptt No.	Year	Area in ha.	Name of Plot	Location
Gondia	95	1994	5.00	Dhawada Preservation Plot	Nagzira(WL)
Gondia	121	1994	5.00	Misc. Preservation Plot	Nagzira(WL)
Gondia	100	1995	5.00	Garadi seed	Nagzira Thadezari (WL)
Gondia	117	2002	5.00	Bija seed	Bijepar Salekasa (T) Gondia
Gondia	149	2004	5.00	Surya seeds	Piteravi (Lakhni) division

- (2) There is no identified Medicinal Plant Conservation Area in the Division of Gondia.
- (3) Preservation plots where valuable species are found, where local bioclimate has brought about different crop composition and any area of biological or silvicultural significance should be identified for creation of Preservation Plots in Gondia.

3.6: FAUNA AND THEIR HABITATS

3.6.1: Description of the Fauna

The Human and cattle population density is varied in Gondia district in and around the forest area. The habitat for wildlife also shows wide variation, the wild animals are unevenly distributed in the Gondia Forest Division, though the forest of Gondia Division is by and large good. The forests of Gondia division belong to miscellaneous forest and are devoid of natural grass lands, essential for the growth of herbivores.

Most of the wildlife is confined to the compact forest blocks of Nawegaon, Arjuni Morgaon, Goregaon, Gothangaon, Chichgad, North Deori & South Deori ranges and adjoining areas of Nagzira WLS and Nawegaon National Park, & New Nawegaon WLS. Besides these areas wild animals like Blue Bull, Wild bear, Barking Deer, Chital, and Leopard are found in almost all ranges of the division.

The data related to the population of Tiger and Leopard seems to be not very realistic as it shows huge variation every year, it might be due to the overlapping areas of Gondia division and the Nagzira Wildlife Sanctuary and the Nawegaon National Park. The territorial field staffs need to be oriented in the field of wildlife management.

3.6.2: Distribution of the Wildlife

Gondia division has a fairly good distribution of wildlife spread all over the division except near the inhabited areas. The wildlife sighting is the best near boundaries along the Nawegaon National Park and the Nagzira Wildlife Sanctuary. Two new wildlife sanctuaries in the Gondia Division, namely New Nawegaon WLS & New Nagzira WLS, which is adjoining Gondia Division. Absence of natural grassland limits the herbivore population. Leopard is found in all ranges, and is commonly found near the villages. Nilgai, Sambhar and Cheetal as well as wild boars are found all over the tract. Tiger is often seen in Chichgarh, Gothangaon, Arjuni Morgaon and North & South Deori Ranges. Jackal, Jungle cat and Hyaena are also common. Gaur and wild dogs are mainly seen near the Nawegaon National Park. Large avifauna can be seen in the tract.

Migratory birds near tanks are common during the season. The Siberian crane is a regular visitor to the tank near the Nawegaon National Park. Barking deer, sloth bear, langur and monkeys are also common mammals. Common wild birds include Painted sand grouse, Common sand grouse, Pea fowl, grey jungle fowl, red jungle fowl, Red spur fowl, Painted

partridge, Grey partridge, Jungle bush quail, Black breasted quail, Indian bustard quail, Common or grey quail, Pigeon, Crane, Dove, Cotton teal, Whistling teal and Comb duck.

The wildlife in the tract dealt with is seriously due to the indiscriminately shooting during the zamindari regime. Hunting by local tribals also contributed in the decline of wildlife even in the interior hilly areas having good forests. Apart from indiscriminate shooting, poaching and hunting, the population explosion and economic developments have led to the severe degradation of natural habitat of wildlife. The food, water and shelter, the basic needs of the wild animals have become scarce in plain, accessible areas. The division is rich in wild life

Biodiversity conservation is an important mandate of the forest department and with the enactment of Wildlife (Protection) Act 1972, wildlife management has become synonymous with biodiversity conservation. The history of wildlife management, summary of Wildlife (Protection) Act 1972 and other important issues of man-animal interface have been summarized under this chapter.

3.6.3: Description of the Wildlife

The location of Gondia Division's forests is very important from the wild life. management point of view and the said areas have already been included in the proposed Tiger Habitat and corridor management. These forests are important for corridor management between the Protected areas like Tadoba, Nawegaoan, Nagzira, Kanha, Pench (MP) and Pench of Maharashtra, as it provides the continuity of forests among these Protected Areas. All of these five Protected areas are Tiger Project areas.

For the adjoining Protected areas, like Nawegaon and Nagzira, these forests provide an additional space too, for the wild animals. Under the present circumstances when most of the Protected areas are facing the problem of corridor. The forests of Gondia Division can provide the solution to this problem, if managed properly with a futuristic approach.

Considering the importance of these forests a separate Working Circle has been included in this Working Plan. This is basically an overlapping working circle, but a few exclusive areas from the point of wildlife management are proposed to be given special protection and treatments for better management of wildlife in the areas, specially where there is a Protected Area around it. The descriptions given in this chapter, applies to the forest area of the Division as well as to the issues relating to control the illegal trade in wild animals and animal articles in and around Gondia city. It includes the total area of the Gondia Division.

Therefore, most of the wildlife confined to the compact forest blocks of Nawegaon, Tiroda and Salekasa ranges adjoining to Nagzira Sanctuary and Nawegaon National Park. The minimum concentration of wildlife is in Gondia range.

Carnivora: (i) Tiger (*Panthera tigris*) (ii) Leopard (*Panthera pardus*) (iii) Wolf (*Canis lupus*). (iv) Striped Hyena (*Hyaena hyaena*) (v) Wild dog (*Cuop alpinus*) (vi) Jackal (*Canis aureus*) (vii) Indian Fox (*Vulpes bengalensis*) (viii) Leopard Cat (*Felis bengalensis*) (ix) Jungle Cat (*Felis chaus*) (x) Commo Mongoose (*Herpestres edwardsi*)

Sighting of tiger & Leopard are expecting in some patches of Nawegaon National Park. Leopard is found in almost all the ranges. Hyena, Jackal and Foxes are found very frequently near the inhabited areas. Wild dogs are found in and around Nagzira sanctuary. Jungle cats are common.

Herbivores: (i) Gava (*Bibos gaurus*) (ii) Nilgai (*Boselaphus tragocamelus*) (iii) Sambhar (*Cervus unicolor*) (iv) Cheetal (*Axis axis*) (v) Barking Deer (*Muntiacus muntjak*) (vi) Wild boar (*Sus scrofa*) (vii) Sloth bear (*Melursus ursinus*) (viii) Four horned antelope (*Tetraceros quadricornis*) (ix) Common Langurs (*Presbytis entellus*) (x) Rhesus Macaque (*Macaca mulatta*), (xi) Bonnet Macaque (*Macaca radita*)

Gava is confined to Nagzira Sanctuary and Nawegaon National Park and they can be seen in the adjoining forest of Gondia Division. Nilgai and Sambar are found in hilly ranges. Chital is found all over the tract. Wild boars are confined to all over the tract. Langur and monkeys are quite common. Barking deer is found in Nawegaon National Park & Nagzira WLS & its Surrounding areas.

Blue bull (Nilgai) is found all over the tract. Rest of the herbivores are found mostly in the compact area. Hares are common throughout the Division.

Rodents: (i) Three striped palm squirrel (*Funambulus palmarum*) (ii) Jungle striped squirrel (*Funambulus sublineatus*) (iii) Porcupine (*Hystrix indica*) (iv) Hare (*Lepus ruficaudatus*) and (v) Jungle Rats and Moles.

Snakes: Kawda (*Lycodon aulicus*), Gavtya snake (*Macropisthodn plumbicolor*), Dhondya (*Natrix piscator*), Dhaman or Common Rat-snake (*Ptyas mucosus*), Indian Rock Python-Ajgar (*Python molurus*), India Cobra or Nag (*Naja naja*), Dandekar (*Bugarus caerulues*), Russel's Viper or Ghunus (*Vipera russelli*). Checkered keel back (*Xenochrophis piscator*)

The rich natural setting has been responsible for rich snake population in the area, *Wheteas pyhtos* (Ajgar) is commonly found deep in the forest.

Fishes: Beside large irrigation reservoirs, many small irrigation tanks are resources for future potential of fishery development in the district. The major catch from the riverine resources comprises local fishes e.g., Tambir (*Labeo bengalensis*), Rengara (*Mystas tengara*). Prawn rearing mainly of *Macrobrachium malcolmsonii*, constitutes an important fishery in the district.

The prawn found in the Wainganga River & other rivers of the district is famous for its quality and taste. It is being tried in other river & tanks in the tract. The important species of fishery found in the tank and other reservoirs are Catla (*Catla catla*), Mrigal (*Cirrhina mrigala*), Botri (*Channa purctatus*), Dookkar machhi (*Nsndus nandus*), Bam (*Mastocemblus pencalus.*) Rohu (*Labeo rohita*), Magur (*Sperata seenghala*)

Wild Birds: (i) Sarus Crane (*Antigone antigaone*) (ii) Painted sand grouse (*Pterocles indicus*) (iii) Common sand grouse (*Pterocles exustus*) (iv) Pea fowl (*Pavo cristatus*) (v) Grey jungle fowl (*Gallus sonne ratil*) (vi) Red jungle fowl (*Gallus gallus*) (vii) Red spur fowl (*Gallus spadicea*) (viii) Painted partridges (*Francolinus pictus*) (ix) Grey partridges (*Francolinus pondicerianus*) (x) Jungle bush quail (*Perdicula asiatica*) (xi) Black breasted quail (*Cturnix coronandelicus*) (xii) Indian Bustard quill (*Turnix suscitator*) (xiii) Common or grey quail (*Coturnix*), (xiv) Pigeon (*Treron phoenicoptera*) (xv) Crane (*Grus antigone*) (xvi) Dove (*Streptpotia spp*) (xvii) Cotton teal (*Nettapus*) (xviii) coromoandelianus Whistling teal (*Dendrocugna javanica*) (xix) Comb duck (*Sarkidiornis melanotus*) (xx) Little Grebe (*Podiceps ruficollis*) (xxi) Cormorant (*Phalacrocorax carbo*) (xxii) Grey Heron (*Ardea cinera*) (xxiii) Large Egret (*Ardea alba*) (xxiv) Black ibis (*Pseudibis papillos*) (xxv) Parikh Kite (*Milvus migrans govinda*) (xxvi) Shikra (*Accipiter badiues*) (xxvii) India Whitebacked Vulture (*Typs bengalensis*). (xxviii) Parakeets Moorhen (*Gallinula chloropus*), (xxix) yellow Legged Green pigeon (*Terno phoenicoptera*).

3.7: THREATS AND CHALLENGES TO WILDLIFE

Poaching: In spite of stringent provision in the wild life and forest laws, poaching, for skin, bones, pets and flesh, continues to be the most important reason for the destruction of wildlife in the division. Poachers usually shoot the animals when they (wild animals) come to waterboties. Therefore, the animals are particularly vulnerable during summer, when number of such water boties is drastically reduced and also water in water hole recedes to minimum.

It has been recently noticed that a new and very dangerous method of poaching through poisoning of drinking water by mixing urea in large concentration has been innovated by the poachers. When an animal drinks such water, it dies within hours due to intense gas

formation in stomach and choking of breathing organs. The poachers then remove the skin or bones of the dead animal for trafficking.

Setting of nets, snares and traps for catching birds, hares and sometimes small animals like deer has been recorded in the past of late the poachers have been found using the improvised traps for killing the large animals, like Tigers and Leopards, very effectively and regularly.

Electrocuting the animals including Tigers by laying live electric wires on the tracks followed frequently by wild animals and by drawing electric current by high tension lines passing through the forests is another new method which is proving to be a potential threat to wild animals, besides sometimes being hazardous to local people.

Wild animals are poached for the skin, bone and meat, and sometimes trapped to serve as pets; Water holes are generally the most vulnerable sites for the poaching. Nets and traps are used for trapping birds, deer and small mammals.

Diseases: The livestock from the villages in the forests regularly frequent the forests and share the water holes used by wild animals. Therefore, various diseases common in domestic cattle, and which spread through contact and are water borne (contagious diseases) are passed from livestock to wild animals. Most frequent is foot and mouth disease. Other diseases which may occur are (1) Anthrax (2) Rabies (3) Haemorrhagic Septicemia (4) Foot & Mouth Disease (5) Canine distemper. FMD has a potential to wipe out large populations, while rinderpest, anthrax and rabies are highly infectious and lead to certain death.

Sharing the forests area with disease-affected domestic animals often compromises health of the herbivore population. Outbreaks of contagious diseases like Foot and Mouth Disease drastically reduce the herbivore population.

Fire and habitat damage: Forest fires are of common occurrence these days. The fires in the interior of the forests, besides destroying the natural habitat of the forest fauna drive them to take shelter near the human habitation and make them easy targets of poacher's guns or local villager's weapons. Due to fire even the young ones of big and strong animals may perish, besides other animals, reptiles and birds, who live on ground and can not escape the fire and its heat. In case if they survive, their food, grasses, herbs and shrubs are destroyed which are already insufficient to meet the requirements of cattle as well as the wild animals.

The whole tract experiences water scarcity in summer. These fires aggravate the already existing water scarcity and expose these animals to above mentioned risks. It increases the man animal conflict.

Due to various human activities the habitat of various wild animals is degrading and is manifested in the form of reduced population of many animal and bird species. The main factors adversely affecting the wild habitat are:

1. Heavy biotic pressures, like over grazing, encroachment on forest lands, large scale human and cattle movement in the forest areas, forest fires etc. are responsible for the general degradation of these habitats.
2. Large scale diversion of forest Land for projects like, irrigation dams and canals are also adversely affecting the wildlife habitat by fragmenting the forest areas and creating permanent barriers for the movement of the wild animals on one hand and risk to their lives, specially for the young ones, on the other hand. The Forest department should convince the Irrigation department to construct suitable passages for wild animals at suitable regular intervals. This could have been avoided, had the DCF put the condition for these passages in the proposal of the project under Forest (Conservation) Act 1980.

3.8: PROTECTION AND MANAGEMENT OF FAUNA

For the protection and management of the wildlife of the Division, a series of steps are taken and proposed to be taken based on the threats as identified in the plan. These include the increased patrolling measures with proper Protection Plan to be updated every year.

Table No. 3.3: Abstract of Species –Wise Offense Cases of Wildlife in Gondia Forest Division

Sr. No	Species Common Name	Range	Total Cases
1	Nilgai	N/Deori	23
2	Sambar	N/Deori	4
3	Wild Boar	N/Deori	4
4	Spotted deer	N/Deori	9
5	Barking deer	N/Deori	2
6	Tiger	N/Deori	1
7	Leopard	N/Deori	2
8	Spotted deer	Gothangaon	1
9	Sloth Bear	Gothangaon	1
10	Nilgai	Gothangaon	2
11	Sambar	Gothangaon	1
12	Wild Boar	Gothangaon	4
13	Leopard	Gothangaon	1
14	Indian Bison	Gothangaon	1

Sr. No	Species Common Name	Range	Total Cases
15	Sloth Bear	S/Arjuni	4
16	Spotted deer	S/Arjuni	7
17	Wild Boar	S/Arjuni	10
18	Leopard	S/Arjuni	4
19	Nilgai	S/Arjuni	4
20	Indian Bison	S/Arjuni	4
21	Peacock	Gondia	1
22	Nilgai	Gondia	3
23	Wild Boar	Gondia	10
24	Tortoise	Gondia	1
25	Spotted deer	Gondia	7
26	Golden Jackal	Gondia	1
27	Sloth Bear	Gondia	4
28	Black Buck	Gondia	3
29	Tiger	Gondia	1
30	Monkey	Gondia	2
31	Rabbit	Gondia	1
32	Jungle Cat	Gondia	1
33	Nilgai	Tiroda	1
34	Spotted deer	Tiroda	6
35	Wild Boar	Tiroda	4
36	Black Buck	Tiroda	2
37	Leopard	Tiroda	2
38	Bar Headed Goose Birds	Tiroda	1
39	Monkey	Tiroda	1
40	Spotted deer	S/Deori	1
41	Leopard	S/Deori	1
42	Leopard	Chichgarh	2
43	Common Giant Flying Squirrel	Chichgarh	1
44	Nilgai	Chichgarh	1
45	Spotted deer	A/Mor	1
46	Indian Bison	A/Mor	1
47	Leopard	A/Mor	2
48	Wild Boar	A/Mor	7
49	Sloth Bear	A/Mor	1
50	Tiger	A/Mor	2
51	Spotted deer	Saleksa	3
52	Sloth Bear	Saleksa	1
53	Striped Hyena	Saleksa	1
54	Wild Boar	Saleksa	3
55	Leopard	Saleksa	1
56	Wild Boar	Goregaon	7
57	Monkey	Goregaon	2
58	Sloth Bear	Goregaon	4
59	Spotted deer	Goregaon	7
60	Black Buek	Goregaon	3
61	Nilgai	Goregaon	5
62	Leopard	Goregaon	2
63	Indian Fox	Goregaon	1
64	Tiger	Goregaon	1
65	Indian Bison	Goregaon	3

Sr. No	Species Common Name	Range	Total Cases
66	Spotted deer	Amgaon	8
67	Wild Boar	Amgaon	3
68	Indian Bison	Amgaon	1
69	Nilgai	Amgaon	3
70	Leopard	Amgaon	1
71	Wild Boar	Nawegaon Bandh	7
72	Wolf	Nawegaon Bandh	1
73	Leopard	Nawegaon Bandh	5
74	Sloth Bear	Nawegaon Bandh	4
75	Four Horned Antelop	Nawegaon Bandh	1
76	Indian Hare	Nawegaon Bandh	1
77	Spotted deer	Nawegaon Bandh	4
78	Peacock	Nawegaon Bandh	1
Total			245

3.8.1: History of the Wild Life Management.

Hunting in the Reserved Forests was regulated according to the hunting licenses issued for specific shooting blocks. The Zamindars used to regulate hunting in the exproprietary forests prior to the abolition of their rights, which was followed by the shooting block system and the licenses similar to the Reserved Forests. Presently, the law does not permit sport hunting of wild animals. The wildlife is threatened by habitat damaged caused by factors like increasing human and cattle population, encroachment for cultivation, poaching facilitated by the improved road network and efficient weapons. Poaching problem has attained a menacing proportion as evident from large seizures all over the country. Greater attention to the wildlife management, however, is a heartening trend. The wildlife and the territorial divisions at Gondia are coordinating their efforts including the eco-development programmer to ensure success of their protection measures.

A number of cattle kill by wild carnivores is reported in the division. Such cattle kills and occasional injuries to the villagers are promptly attended, and the loss is compensated in accordance with the prevailing policies.

From time immemorial the wild animals have occupied a place of pride in the folklore of Indian culture. They were respected and protected by the tribals, who never used to kill the animals for fun or pleasure. However, hunting became an important pastime for the Rajas and Maharajas who used to hunt and kill the animals for fun meat as well as for preparing trophies. In the Reserved Forests, hunting was restricted and licenses were used to be issued for small game, big game etc. and shooting blocks were set apart, where the animals specified in the license only could be hunted.

Prior to the abolition of the proprietary rights, hunting in the malguzari forests was done with the permission of the malguzars. Consequent to the vesting of these forests in the Government as Protected Forests, hunting in these forests was also regulated by fixing shooting blocks and by issuing licenses.

However, after the enactment of the Wildlife (Protection) Act 1972 the hunting and trading of wild animals and its trophies were strictly monitored and subsequent amendments in this act in 1991 and 2002, hunting of any animal included in the Schedules of Wildlife (Protection) Act 1972, (other than vermin), as game or sport, has been completely banned. Hunting of wild animals however can be allowed for special purposes, after prior permission of CWLW, but only in exceptional circumstances. This act also enjoins on us the responsibility for wildlife conservation outside the protected areas. The maintenance of biological diversity is the new mandate of National Forest Policy 1988. Reduction of human wild life conflict and a focus on wildlife health among others National Wildlife Action Plan (NWAP) 2017-2033

The wildlife, which used to flourish in the forest of the division, is threatened due to various factors like population explosion, encroachments, over grazing, regular forest fires, improved network of roads and availability of sophisticated weapons. Due to increase in demand for wildlife products all over the world, poaching problems have increased over the years in and around Nagpur, which is nearby to Gondia district, special efforts are required to be made by the Division to protect the wildlife in the region.

Besides these, mammals there are many other animals belonging to amphibian, reptilian, and avian groups. Out of them many birds are migratory and visit the area in a particular season, mostly during winter. They are under great threat from poachers and (aquatic birds) fishermen.

3.8.2: Injuries Due To Wildlife: The carnivores, Tigers and Leopard particularly sometimes kill domestic cattle grazing in the forests. There are also cases of human injury and even death due to attacks from wild animals. The villagers sometimes indulge in poisoning the carcass to take revenge and cases of electrocution of wild animals by the villagers to kill the animal suspected to have killed the cattle have also been reported. In such cases the persons involved in illegal killings of the wild animals do not have any intention of poaching or trade but such activities on the part of local people pose grave danger to animal populations in the forests. The Govt. of Maharashtra therefore has evolved a policy of compensating for the loss of livestock as well as for the injury or losses of human life vide Revenue & Forest Department, Government Resolution No. WLP-0718/CR-267/F-1, Mumbai dated 28-11-2018 And WLP-

0718/CR-267/F-1, Mumbai dated 23/08/2022 & WLP-0718/CR-267/F-1, Mumbai dated 03/08/2023

Compensation for the Loss of Livestock

The scheme, which was introduced for the first time in 1971, covers the loss of Cow, Buffalo, Bullock, Sheep, Goat and other livestock (as per definition given under Section 2(1 SA)) due to attack of a Tiger, Panther or any other wild animal. The present rates of compensation as per the GR No. WLP-0718/CR-267/F-1, Mumbai dated 28/11/2018 & WLP-0718/CR-267/F-1, Mumbai dated 23/08/2022.

The compensation to livestock damage has to be given as per the terms and condition mentioned in the Govt. Resolution No. WLP-0718/CR-267/F-1, Mumbai dated 28/11/2018 & WLP-0718/CR-267/F-1, Mumbai dated 23/08/2022 some the conditions to be fulfilled are as under:

1. Death to be reported within 48 hours.
2. Carcass is not to be removed before case is made.
3. No death of any wild animal within 10 km radius area in the next 6 days.
4. Immediate investigation by forest officers as to the wild animal, which killed the cattle as well as Likely amount of compensation
5. Compensation to be sanctioned by an officer not below DCF.
6. No compensation in case the livestock was grazing illegally.

Compensation for the injury to and Loss of Human Life:

Introduced through GR dated 27.1.1986, the scheme covers death as well as injury including minor injury caused to any individual in an attack by a wild animal. Any such attack by Tiger, Panther, South Bear, Bison, Wild Pigs, Wolf, Hyena, Jackal and wild dogs is covered under the scheme. Present rates of compensation have been fixed through Govt. Resolution No. WLP-0718/CR-267/F-1, Mumbai dated 28/11/2018, WLP-0718/CR-267/F-1, Mumbai dated 23/08/2022 & WLP-0718/CR-267/F-1, Mumbai dated 03/08/2023. These are as follows:

Table No. 3.4: Compensation for the Injury and Loss of Human Life

S.N.	Particulars	Amount to be Paid
1	Death	Rs.25,00000/- lakhs.
2	Permanent disability.	Rs.7,50,000/- lakhs.
3	Major injury	Rs.5,00,000/- Lakh.
4	Minor injury	Rs.50,000
Note: Cost of medication, preferably in govt. hospital, but in case of unavailability, private medication.		

The compensation to injury & loss human life has to be given as per the terms and condition mentioned in the Govt. Resolution No.WLP-0718/CR-267/F-1, Mumbai dated 28/11/2018 & WLP-0718/CR-267/F-1, Mumbai dated 23/08/2022 some of the conditions for claiming and deciding above compensation are as under.

1. Such attack should not have occurred when the individual was indulging in violating the Wildlife (Protection) Act 1972.
2. Relative/friend should report the attack within 36 hours.
3. Police/forest officer to investigate within 3 days.
4. Death/injury due to wild animal is to be certified by the govt. medical officer.
5. Compensation due to death is to be given only to legal heir and compensation due to injury is to be given to individual concerned.
6. Compensation is to be sanctioned by the officer not below the rank of DCF/DFO

3.8.3: Legal Position

The first step towards the protection of wildlife was taken by including certain provisions, in this regard, in the Berar Forest Act of 1886. Under Section (3) sub section 7, the definition of forest produce incorporated the 'skins, tusks, bones and horns' and as per Section 10, sub section 4, The residency by orders may regulate any part of the State Forests for hunting, shooting, fishing, poisoning water and setting up traps or snares.

The Berar Forest Act 1886 amended in 1891 provided under section 7(b) that Forest Produce includes the following when found in or brought from a forest: "Wild animals, skins, tusks, horns, bones, silk cocoons, honey and wax and all other parts or produce of animal." Section 7 (2)(b) of this act after this amendment provided that anyone who hunts, shoots, fishes, poisons water or sets traps or snares, shall be punishable with the fine which may extend up to fifty rupees or, when the damage resulting from the offence amounts to more than twenty-five rupees, to double the amount of such damage. Section 10(4)(iii) of this act empowered the resident to frame the rules regarding regulation of hunting, shooting, fishing, poisoning water and setting traps and snares.

Vide Notification G.L.F.D. No. 2197-1-B, dated 13th October 1911, the Indian Forest Act 1878 was also made applicable. The section 2(b) (iii) included wildlife in its definition of the forest produce. Section 25 (i) provided that any person in contravention of any rules, which the local Government may from time to time prescribe, kills or catches elephants, hunts or shoots fishes, poisons water or sets traps or snares shall be punishable with imprisonment

for a term which may extend to six months or with fee not exceeding five hundred rupees or with both in addition to compensation for damage done to the forests.

After the promulgation of the Indian Forest Act 1927 rules relating to wildlife regulations were framed under section 26(I) and 76(d). These were essentially to regulate hunting of wild animals. Wild Birds and Animal Protection Act 1912 as amended in 1935 also ensured protection to certain animals and a check on hunting of others. Shooting block system of hunting was started from 1927. Under the provisions of the two acts, the Conservator of Forests in consultation with the DCF concerned used to declare areas having abundant game as open to hunting. The DCF accordingly used to issue shooting permits, wherein the type of game and their number allowed to be hunted together with other relevant conditions were used to be mentioned.

The Bombay Wild Animals and Wild Birds Protection Act 1951 was extended to Vidarbha region from 1.6.1961. Though this act did not propose a significant change in the management of game in the Reserved and the Protected Forests, yet it incorporated following significant provisions:

1. Its provisions were also applicable outside the Reserve and the Protected Forests.
2. Arms license holders for sports were to register themselves with the Wildlife Preservation Officer.
3. This Act prescribed a closed season for hunting and classified game into four categories, viz. small game, big game, special big game, and pet animals.
4. It also sought to control transaction in trophies and other wildlife products.
5. Wildlife Advisory Board was constituted under this act to advise the government on various important matters concerning wildlife.

Developments after 1972

At the national level, the Indian Board for wildlife was constituted in 1952. Its main object was to devise ways and means for conservation of wildlife through coordinated legislative and practical measures and sponsoring setting up of National Parks and Wildlife Sanctuaries. A comprehensive and unified National and State Park Act 1971 was passed which provided for appointment of an Advisory Committee to advise in regard to the constitution and declaration of National Parks and Sanctuaries and formulation of policy for their administration and management. The Parliament then enacted the Wildlife (Protection) Act 1972, which came into force in the State of Maharashtra with effect from 01.06.1973 with this, other acts relating to any matter contained in this Act and in force in the State stood

repealed. This act as amended from time to time as well as the various regulations made under this act and guidelines issued by the central and the state govt. provide for establishment of a network of national parks and sanctuaries representing various habitats and for giving protection to all type of wildlife in the state. These provisions also address issues relating to the management of wildlife outside the protected areas. Following rules have so far been enacted under the relevant sections of this act.

- 1 The Wildlife (Stock Declaration) Rules, 1973 (became effective in Maharashtra with effect from 1.6.1973)
- 2 The Wildlife (Transactions and Taxidermy) Rules, 1973 (became effective III Maharashtra w.e.f. 16.1973).
- 3 Wildlife (Protection) (Maharashtra) Rules, 1975 (became effective from 6.3.1975).
- 4 The Wildlife (Protection) Rules and Licensing (Additional matters for consideration) Rules, 1983(became effective w.f. 13.4.1983).
- 5 Wildlife (Protection) Rules, 1995
- 6 Wildlife (Specified Plants-Condition for Possession by License) Rules, 1995
- 7 Recognition of Zoos Rules, 1992.
- 8 Declaration of Wildlife Stock Rules, 2003.
- 9 Wildlife Disposal of Wild Animal Article Rules, 2023
- 10 Living Animal Species (Reporting and Registration Rules), 2024
- 11 Captive Elephant (Transfer or Transport) Rules, 2024
- 12 Wildlife (protection) Licencing (Additional Matters for Consideration) Rules, 2024

Besides the above specific legal framework available for wildlife management, provisions contained in Indian Forest Act 1927, Forest Conservation Act 1980 and The Environment (Protection) Act 1986 may go a long way in protecting and conserving the biodiversity of this division. Clearance under the Environment Protection Act 1986 from environmental angle is required from the govt. of India for any project (other than those relating to improvement of forests and particularly the projects relating to industrial activities damaging the environment of these Protected Areas) including an industry located within 10 km from these PAs.

Management of Wildlife: Wildlife and its management in Gondia Forest division have been discussed in detailed in the part 2 of Volume I of this working plan, under Wildlife (Overlapping) Working Circle. The detail prescription for Special objectives of management for development & conservation of wildlife & its habitat, recommendations for future

management, habitat development works, water hole development, protection measures for wildlife, other protection measures and eco-development, awareness generation and eco-tourism etc. has been given in Wildlife (Overlapping) Working Circle in part 2 of this working plan.

Gondia is one of the last home left in Central India for Sarus crane. The programmes like “Sarus mitra” are being implemented in the Gondia division with the support of district management and NNTR Foundation.

Hon. Bombay High Court, Nagpur Bench filed suo moto PIL No. 2/2021(Court on its Own Motion Vs. State of Maharashtra & Ors.) for conservation of Sarus. Hon. High Court had given directions to District Collector, Gondia to Prepare ‘Sarus Conservation Plan’ and establish ‘Sarus Conservation Committee’ for Gondia and neighbouring districts. To prevent death/injury of Sarus due to electrocution, Hon. Court also directed district Collectors of Gondia, Bhandara and Chandrapur for provision of funds for Arial Bunch Cabling (ABC). Sarus population estimation was carried out jointly by Gondia Forest Division (Territorial), volunteers of NGO ‘SEVA’ and local farmers. Following Table gives the year wise Sarus population estimation.

Sarus Population in Gondia District	
Year	Population
June 2017	37
June 2018	35
June 2019	40-42
June 2020	45-47
June 2021	39
June 2022	36
June 2023	31

CHAPTER 4

MAINTENANCE AND ENHANCEMENT OF FOREST HEALTH AND VITALITY

4.1: STATUS OF NATURAL REGENERATION

Data on regeneration status collected along with enumeration of the crop in 0.04 ha sub-plots in the enumeration plots. The data are analyzed and used to devise prescriptions for regeneration in the forest areas by both the natural and artificial. The focus is on tending of existing natural regeneration of seed based saplings. Plantation is proposed only as a supplementary activity limited to the extent to fill the deficiency in natural regeneration, on the degraded and blank areas, other than natural blanks.

During 2010 to 2012 for preparation of earlier plan, the Forest Resources Survey Unit, Amravati carried out the tree enumeration in 0.36 hectare (60 m x 60 m) plots and the regeneration survey in 0.04-hectare (20 m x 20 m) sub-plots. The systematic line plot sampling was done at the intersections of 600-meter grid.

The Forest Inventory Management System was used for analysis.

4.2: AREA AFFECTED BY FOREST FIRE

The area affected by forest fires is given in the table 4.1. During the last ten years there have been fire incidences and the figures show that the number of incidences fluctuates from year to year perhaps as per the climate condition prevailing on that year.

Table No. 4.1 Year-wise Forest Fire Cases

Year	Fire incidence	
	No. of Cases	Area in Ha
2012	166	15.3900
2013	172	15.3935
2014	67	190.1000
2015	38	105.0000
2016	87	263.5800
2017	219	357.2810
2018	241	686.0760
2019	326	454.3100
2020	320	506.4300
2021	384	826.2930
2022	332	725.7410
Total	2352	4145.5945

Incidences of ground fire are very common in dry deciduous forests because of abundant combustible matter such as dry leaf litter, dry grasses and twigs. Scorching heat from the forest fire inflicts considerable damage by killing or damaging saplings, seedlings, ground flora and micro flora. Almost all fire incidences are man-made. Tendu contractors often influence setting up fire to obtain profuse flush of Tendu leaves during the collection season. Local villagers set fire to clear undergrowth under Moha and gum-yielding trees to facilitate convenient collection. Sometimes, villages also set forest fire to obtain good flush of grasses. Such fires if left unattended spread to the adjoining forest areas. Summers are hot and dry from February to mid-June during which forests are vulnerable to fires. Fires taking place at the end of winter and beginning of summer are not severe. Whereas, a fire in the hot summer is very harmful as it kills the young seedlings and coppice shoots of all major species and plantations. Severe fire causes considerable damage to the trees also by scorching their bases which ultimately leads to unsoundness and hollowness and renders them liable to attack by fungi and insects. Fire also indirectly causes soil erosion by destroying the soil cover as well as the organic matter.

Many valuable species of NTFP in the form of herbs, shrubs and climbers are also vanishing due to regular fire in the forest. Besides the damages to the flora of the forest, fire causes immense damage to the Fauna found in these forests. The worst sufferers are the lower animals like insects etc., amphibians, reptiles, mammals and birds nesting on the ground. Besides these the micro-organisms found in the surface soil are also destroyed.

Cutting and burning of fire lines is done before every fire season. Also fire watchers are employed and fire patrolling is done during fire season. But still fire remains major threat to forest.

Before the onset of fire season, firefighting equipments like blower should be provided to ground level staff. Higher officers in the forest division should aware and train field staff about firefighting. People awareness programmes should be conducted to sensitize local people about harms caused by forest fire to biodiversity.

4.3: AREA DAMAGED BY NATURAL CALAMITIES

Damage by drought, frost, wind and hailstorms: Frost is very rare in Gondia Division. Slight damage to young regeneration due to frost in the low lying areas of present Tirora range and Nagzira sanctuary was recorded during 1928-29 and 1936-37. Damage due to drought is not common. However, some damage to the young natural regeneration and plantations is caused in the year in which the rainfall is irregular or scanty. The scanty rainfall

results in occasional dying of bigger trees which are severely damaged by fire. Strong winds during pre-monsoon or monsoon period cause uprooting of trees all over the forest area. Occasionally hail storms damage the fruit crops of Moha and Char. Hailstorm in the month of April and May sometimes damages Tendu leaves making them unfit for Bidi manufacture.

Soil Erosion: Soil erosion is noticed all over the forest areas of division. The top layer of soil which stores organic matter, and nutrients, on which plants feed, is lost in this process. It decreases the soil fertility, lower the sub-soil water level and water holding capacity of the soil. Sheet erosion in plains and gully erosion on slopes is moderate in most of the areas of the forest.

But it is increasing at an alarming rate in forest all over the division. The erosion has increased due to excess harvesting of coupes without soil conservation works in the subsequent year of felling, excessive grazing and repeated fires.

4.4: AREA PROTECTED FROM GRAZING

The entire forests are liable to damage from grazing including grazing by goats, except the interior areas, which are away from the villages. The 'A' class forests adjoining the Berar plains are very hilly, and the upper slopes are steep. The grazing is, therefore, confined to the lower hills and the calculated incidence does not give the true picture of the grazing pressure here, while a large inaccessible area of the units remains un-grazed. A realistic calculation of grazing incidence is required.

The grazing incidence figures are much heavier than estimated. Damage caused by uncontrolled grazing is heavy due to large cattle population. The grazing incidence, as prescribed in the grazing policy of 1968 of Govt. of Maharashtra, is not followed. The Cattle of the erstwhile forest villages are also grazing in the immediate vicinity of the villages. The grazing incidence in the areas adjoining the villages is therefore, very detrimental to the forest conservation. Moreover, the Protected Forests have nistar rights for grazing and they have so far not been worked under any scientific forest management. Due to this, the protected forests are more vulnerable to heavy grazing. Even large numbers of goats are also seen grazing in the forest. Continuous and heavy incidence of grazing, not only prevents regeneration of tree species, but also the plantations and young regeneration obtained during the period of closure is lost soon after the areas are open to grazing. In fact, the closure of forest areas is only on paper, in reality grazing is carried out in all areas including the current coupes and plantations.

Areas with clayey soil, after trampling by cattle results in compaction, change in structure of the soil and reduction in soil aeration. In sandy soils heavy grazing results in accelerated erosion and denudation. Due to over grazing the wild animals also suffer due to scarcity of fodder in the forest.

Grazing by sheep and goat is highly damaging to the flora as well as for the soil. These animals not only browse the foliage of plants and grasses but also uproot and eat away the roots and rhizomes of the grasses as well as the bark of the young plants, leading to exposure of the soil and drying of saplings. Due to the structure of the hoof of sheep and goats, the pressure exerted on the soil due to their body weight is very high which leads to the compaction of the surface soil. Once the soil becomes compact, it becomes very difficult for the wild seeds to germinate during the rainy season.

Grazing shall be regulated as per guidelines of Grazing Policy 1968 of Maharashtra State issued vide Resolution No. MFP-1365/132211-Y dated December 6, 1968 and Grazing Rules issued vide No. MFP-1371/237035-Z dated November 3, 1973. However, no grazing beyond carrying capacity shall be permitted.

Heavy cattle pressure adversely affects the forest regeneration and soil condition. The present political economy of domestic animals in the area throws up strong challenge, and implementation of the Grazing Regulations in its current form. Therefore, special efforts need to be taken up to ensure that no grazing is allowed beyond carrying capacity any encourage villages for stall feeding.

4.5: LOPPING PRACTICES:

The valuable resource trees like Kulu, Dhaoda, Saja etc. are getting damaged due to unscientific methods of harvesting of gums and Kosa silk. Trees are burnt to harvest honey. Same is the case with various herbs and shrubs, their number is reducing very fast due to unsustainable harvesting. Tendu trees are felled to or heavily lopped to collect Tendu leaves.

4.6: AREA INFESTED BY INVASIVE WEED SPECIES IN FORESTS.

4.6.1: By Parasites: Vanda (*Loranthus longiflorus*) is generally found on the branches of Char, Hiwar, Salai and sometimes on Tendu, Saja, Dhaoda and Lendia.

4.6.2: By Climbers and Obnoxious Weeds: The common climbers in the division are Eruni (*Zizyphus oenoplia*), Chilati (*Mimosa hamata*), Palasvel (*Butea superba*), and Kukudranji (*Calycopteris floribunda*). In the moist areas Maravel is also found. These climbers, coppice vigorously and are hardly affected by fire. The damage is caused by strangling of trees when they entwine a sapling or a tree. Usually, the apical bud is destroyed. The deep grooves

formed by entwining in the large trees reduce the yield of timber. Tarota (*Cassia tora*) is the common weed. In some areas Lantana has also come up. The thick cover of Lantana prevents the regeneration of other trees. Congress grass (*Parthenium hysterophorus*), has also started invading the forest areas.

4.7: INCIDENCES OF PEST AND DISEASES:

Teak suffers from attacks of defoliators (*Hyblia purea*) and skeletonizers (*Hapalia macharalis*), but the damage caused by the attack has not been quantified. Mortality caused by termite in weaker plants is observed in some parts of the division. Parasite called Vanda (*Loranthus longiflora*) can be seen in some trees specially char, Hiwar, etc. Climbers like Chilati, Palasvel, Bokadvel, Yeruni, Kukudranj and Mahurvel entwine saplings or trees and damage by strangulating the plants. Damage due to fungi is un-assessed.

4.8: FOREST DEGRADATION AND ITS DRIVERS

These forests are liable to the following, injuries:

i) By man: The damage by man can be classified into, following two categories.

(a) Illicit Cutting:

Illicit cutting of forests for timber, poles, firewood and agricultural implements is a major factor causing problems for the forests throughout the division. Though it is varying in degree, it is heavy in areas adjoining to thickly populated towns and villages. City and towns having extensive construction activities serve as the main consumption centres of illicitly cut timber. Gondia, Deori, Amgaon, Goregaon and Sakoli as well as Nagpur and adjoining areas in the Madhya Pradesh and Chhattisgarh are recognised as such consumption centres, where timber is in great demand for large scale construction activities. Due to sharp increase in the cost of timber, illicit cutters use various modes for transport from head load to truck and take away the timber, to faraway places even up to Nagpur. Besides this, the construction activity has increased in villages which also put extra pressure on these forests.

The increase in population has resulted in the increased demand for fuel wood which also provides an easy employment to local villagers. Illicit cutting and lopping of Tendu trees for leaf collection has also increased. Due to increase in the network of roads in the forest as well as outside the forest areas, the protection of forest has become more difficult. The long-term damage done by head loaders are more severe than the illicit cutting of big trees by the timber smuggler, as the head loaders carry away several future trees in one head load thus inflicting a very serious blow to the future crop.

Illicit Felling during the Last 10 years is given in Appendix No. XXXVIII.

(b) Encroachment:

There have been large scale clearances of the forests in the past for encroachment with a purpose to get agricultural crops. The State Government has issued orders vide GR No. LEN/1078/3483/G-1, dated 27.12.1978 and FLD/1079/1366/F-3, dated 12/09/1979 to regularize all the encroachments on forest lands done during the period from 01.04.1972 to 31.03.1978. This has increased the tendency of people to encroach upon the forest land with a hope that in future also such encroached lands will be regularized by the Government. Generally, the Reserved Forest boundaries are better demarcated, but boundaries of the Protected Forests and the unclassified forests are often in poor conditions. Poorly demarcated boundaries encourage encroachments because encroachments in such cases may remain undetected for much longer period. The problem of encroachment is more on Protected Forests, as they are adjoining the cultivation and villages and there is no proper demarcation at most of the places. Though, the tendency of encroachment has been checked to a large extent because of the Forest (Conservation) Act, 1980. The forest guards and foresters need to be made more sensitive about the forest encroachment, and special drive for eviction of encroachments is required. The encroachment on forest land after 1978 is given in **Appendix No. XLI.**

(ii) By cattle:

Cattle population is much in excess of the carrying capacity of the forest area. Continuous and heavy grazing adversely affects natural regeneration, plantations and the soil conditions. Damage caused by uncontrolled grazing is heavy due to large cattle population. The grazing incidence, as prescribed in the Grazing Policy of 1968 of Government of Maharashtra is not followed. Moreover, the Protected Forests have Nistar rights for grazing and they have so far not been worked under any scientific forest management. Due to this the Protected Forests are more vulnerable to heavy grazing. Even large numbers of goats are also seen grazing in the forest. Continuous and heavy incidence of grazing not only prevents regeneration of tree species but also the plantations and young regeneration obtained during the period of closure is lost soon after the areas are open to grazing. In areas with clayey soil, the trampling by cattle results in compaction of soil and reduction in the soil aeration. In sandy soils heavy grazing results in accelerated erosion and denudation. Due to over grazing the wild animals also suffer due to scarcity of fodder in the forest.

Grazing by sheep and goat is highly damaging to the flora as well as the soil. These animals not only browse the foliage of plants and grasses but also uproot and eat away the roots and rhizomes of the grasses as well as the bark of the young plants, leading to exposure of the soil and drying of saplings. Recently the Govt. of Maharashtra vide its G.R No.MFP-2103/Case No.135/F-1, dated 29.10.2007 has granted permission for grazing of sheep in the forest area including Gondia Division. The illegal grazing by goats and sheep is already in practice and if it goes uncontrolled it will lead to irreversible degradation of forest leading to severe scarcity of fodder in the forests. The degradation of forest will not be limited only to the flora and fauna but it will degrade the land itself, as the single biotic factor contributing to the desertification is the uncontrolled grazing in general and grazing by herds of sheep and goats in particular.

(iii) By wild animals:

The damage by wild animals in Gondia Division is, generally, very little. Chital and Nilgai, which are found all over the forest and Bison, found near Nagzira sanctuary, browse young seedlings and coppice growth. Some damage is caused by wild boars, by digging the roots of young plants and bamboo rhizomes. Monkeys cause some damage to fruit trees, Sissoo seedlings and succulent bamboo clumps.

(iv) By insects:

Teak suffers from attacks of defoliators (*Hyblia purea*) and skeletonizers (*Hapalia macharalis*), but the damage caused by the attack has not been quantified. Mortality caused by termite in weaker plants is observed in some parts of the division.

(v) By wind and hail storms:

Strong winds during pre- monsoon or monsoon period cause uprooting of trees all over the forest area. Occasionally hail storms damage the fruits crops of Moha and char. Hailstorm in the month of April and may sometimes damages Tendu leaves making them unfit for bidi manufacture.

(vi) By fire:

Incidences of ground fire are very common in dry deciduous forests because of abundant combustible matter such as dry leaf litter, dry grasses and twigs. Scorching heat from the forest fire inflicts considerable damage by killing or damaging saplings, seedlings, ground flora and micro flora.

Almost all fire incidences are man-made. Tendu contractors often influence setting up fire to obtain profuse flush of Tendu leaves during the collection season. Local villagers set fire to clear undergrowth under Moha and gum- yielding trees to facilitate convenient collection. Sometimes, villages also set forest fire to obtain good flush of grasses. Such fires if left unattended spread to the adjoining forest areas. Summers are hot and dry from February to mid-June during which forests are vulnerable to fires.

Fires taking place at the end of winter and beginning of summer are not severe. Whereas, a fire in the hot summer is very harmful as it kills the young seedlings and coppice shoots of all major species and plantations. Severe fire causes considerable damage to the trees also by scorching their bases which ultimately leads to unsoundness and hollowness and renders them liable to attack by fungi and insects. Fire also indirectly causes soil erosion by destroying the soil cover as well as the organic matter.

Many valuable species of NTFP in the form of herbs, shrubs and climbers are also vanishing due to regular fire in the forest. Besides the damages to the flora of the forest, fire causes immense damage to the Fauna found in these forests. The worst sufferers are the lower animals like insects etc., amphibians, reptiles, mammals and birds nesting on the ground. Besides these the micro-organisms found in the surface soil are also destroyed. Fire incidences during 2012 to 2022 are given in the table no. 4.2.

4.9: POLLUTION CONTROL AND PROTECTION OF ENVIRONMENT

Gondia is a developing District devoid of major industries. The following Industries are operating in Gondia District as per the information received from the held by the WPO with the DCF and other Officer of the Division.

Table No.4.2: Industries Operating in Gondia District

Range	Name of Industries	Location
Tiroda	Adani Power Plant	Tiroda
Gondia	Bajaj Chemical Industry	Gondia
Gondia	Sun Power Industry	Gondia
North Deori	MIDC	Deori
Tiroda	MIDC	Mundipar
Gondia	Shri Hari Play Wood Co. Ltd.	Murpar
Gondia	Gajanan Agro Industries Lakh Udhyog	Gondia
Gondia	Chotabhai Jethabhai Bidi Company	Gondia
Gondia	Devendra Trading Company	Gondia

Gondia	Manohar Ambalal and Company	Gondia
Gondia	Vidharbh Tobacco Ltd	Gondia
Gondia	Patel Tobacco Ltd	Gondia
Goregaon	MIDC	Hirdamali
Amgaon	Nicco Industries	Dhobitola

The above industries are said to be in the non-forest areas. However, their effect on the forest areas and on the water resources of the forest cannot be ruled out. There is always a tendency of industries to dump their waste/effluents into open secluded spaces including forest areas. At a time when a huge chunk of hitherto neglected zudpi jungle area has been transferred to be managed by the forest department, the Gondia Forest Division should take all cautions against all pollution & disturbance to the forest areas.

CHAPTER 5

CONSERVATION AND MAINTENANCE OF SOIL AND WATER RESOURCES

5.1: AREA TREATED UNDER SOIL AND WATER CONSERVATION MEASURES

The exact area treated under soil conservation cannot be assessed as no special work for soil conservation alone is carried out but SMC works form part of the plantations works. In the Division, plantations are taken up every year and can safely be presumed that this area is treated for soil conservation. However, in the last two years, in view of the Jalayukta Shivar project, large areas are being treated specifically for soil and water conservation.

5.2: DURATION OF WATER FLOW IN THE SELECTED SEASONAL STREAMS

The main rivers passing through the division are Wainganga, Chulband, Garvi and Bagh, which are fed by many small ephemeral tributaries. The area has major irrigation projects, Itiadoh, Sirpur and Kalisarand, Pujaritola and seven medium irrigation projects. A Large number of big and small tanks are used for irrigation, fisheries and drinking water sources. Sources of drinking water are wells, hand pumps, water supply schemes and a network of canals. Most tanks are shallow and seasonal in nature. Low rainfall years witness acute shortage of water in the area. The minor tanks and small tanks are shallow and are mostly seasonal in nature. Seepage at the tank bed and evaporation on surface from these tanks are relatively high and they fail in their water supply during the hot weather or years of low rainfall.

Wells: - There are irrigation wells and other wells. There are large number of tube wells and hand pumps. The main source of water supply for drinking is through wells, hand pumps and water supply schemes. Forest department has also constructed wells in the staff colonies, rest houses and nurseries.

5.3: WETLANDS IN FOREST AREAS

As per the information received from the division, the following are the major dams that are in or in the vicinity the forest areas of the gondia forest division. Most of these dams are outside the forest areas but the major chunk of their watershed areas is within the forest areas.

Table No. 5.1: Major Dams in or in the Vicinity of the Forest Areas

Sr. No.	Name of Dam	Range
1	2	3
1	Ovara Dam	North Deori
2	Shirpur Dam	
3	Kalisarand Dam	
4	Nawegaon Bandh Dam	Nawegaon Bandh
5	Gangezari Dam	
6	Chorkhamara Dam	Tiroda
7	Risala Dam	
8	Bodalkasa Dam	
9	Bhadbhadya Dam	
10	Poojaritola (Kotra) Dam	Salekasa
11	Bevartola Dam	
12	Itiadh Dam	Gothangaon
13	Chulabandh Dam	Goregaon
14	Katangi Dam	
15	Ghumarra Dam	
16	Mama Talav	
17	Zilmili Talav	Gondia
18	Paraswada Talav	
19	Khalbanda Talav	
20	Pangadi Talav	
21	Saibon Talav	
22	Pawan Talav	Amgaon
23	Saras Talav	
24	Mandodevi Talav	
25	Malijunga Talav	Sadak/Arjuni
26	Umarzari Dam	

The status of the wetlands has not been studied by the division and there is a need for the ecological study and avi-faunal documentation of the areas. It may be mentioned that some of the areas are known to be good habitat of birds which may even qualify for Important Bird Area status.

5.4: WATER LEVEL IN THE WELLS IN THE VICINITY (UP TO 5 KM) OF FOREST AREA

The main source of water supply for drinking is through wells, hand pumps and water supply schemes. In summer, shortage of drinking water is felt in many villages, especially in years of low rainfall. During this period drinking water is supplied by tankers and bullock carts to the scarcity villages. Forest department has also constructed wells in the staff colonies, rest houses and nurseries. There is a need to collect the data for the whole 5 km

radius from the forest vicinity and to monitor the rise and fall of the levels over the seasons and the years.

5.5: STATUS OF AQUIFERS

Regarding the status of aquifers, an abstract from the document “Report on the Dynamic Ground Water Resources of Maharashtra 2011-12” brought out by GSDA, Pune & CGWB, Central Region Nagpur is produced below:

An overwhelming population of rural Maharashtra and to some extent urban populations is dependent on groundwater for drinking purposes. It has been observed that prior to the year 1972 the use of groundwater was relatively insignificant in the State. Subsequently due to frequent occurrence of droughts, limitations of the availability of surface water, development of low-cost drilling devices, easy availability of institutional finance, and energization etc. led to proliferation of irrigation wells.

Groundwater is a natural resource with both ecological and economic value and is of vital importance for sustaining life, health and integrity of ecosystems. This resource is increasingly threatened by over-extraction which has insidious long-term effects. Scarcity and misuse of groundwater pose a serious threat to sustainable development and livelihood.

It is a well-known fact that the large number of irrigation borewells/tube wells are the main source of irrigation across the State and a sustentative number of these are not even on record for electricity connections. If actual draft from those borewells/tube wells had been accounted for then the balance position would have certainly emerged as alarming.

Groundwater is one amongst the State’s most important natural resources. It provides drinking water to rural as well as urban community, supports irrigation & industry, sustains the flow of streams & rivers and maintains wetland ecosystem. There is significant freshwater deficit in many areas of the State. Human health, welfare and food security are at risk unless the groundwater resources are managed more effectively and efficiently by the community. It is very much obvious that over extraction of ground water over years without any compensatory replenishment is affecting large tracts of land adversely. The non-replenishment of the shallow aquifers and depletion of the deeper aquifers on account of unregulated sinking of deep borewells/tube wells, almost amounting to “water-mining” unmindful of the adverse ecological effects is one of the contributory causes for recurring droughts. Concerted action, therefore, is needed to reverse the present trend of periodic occurrence of droughts.

It would also be necessary to plan and control the use of groundwater under the prevailing conditions. Publication and distribution of annual reports and related programmes for creating awareness amongst the community and for educating them will have to be undertaken regularly. This will enable avoiding scarcity, as well as the hectic activity and excessive expenditure that has become characteristic of summer months.

5.5.1: Groundwater Recharge

During the field visit it was observed that the water conservation structures are not being de-silted annually throughout the State. This has directly reflected in reduction of recharge due to water conservation structures. Thus, there is dire need to carry out the de-silting of water conservation structures in programme or movement mode.

5.5.2: Effect of Rainfall on Groundwater Availability

The rainfall is the primary source for the yearly replenishable groundwater in the State and has a direct impact on groundwater recharge. The variability of rainfall is also reflected into the groundwater availability. The rainfall deficit and recharge to groundwater are in inverse proportion.

5.5.3: Ground Water Resources

Central Ground Water Board and Groundwater Survey and Development Agency (GSDA) have jointly estimated the ground water resources of Gondia district. Following table shows ground water resources of Gondia district from the 'Report on Dynamic Groundwater Resources of Maharashtra-2024'.

5.5.4: Water Conservation and Artificial Recharge

The artificial recharge structures feasible are check dams, gully plugs, percolation tanks, nalla bunds, etc. Existing dug wells can also be used for artificial recharge; however, the source water should be properly filtered before being put in the wells. The most feasible artificial recharge structure suitable for Alluvial areas restricted along the banks of Rivers and its tributaries, are shallow recharge wells on the river bed of the tributaries. Percolation tanks are also suitable, wherever source water availability is there.

The sites for artificial recharge structures need to be located where the hydrogeological conditions are favorable, i.e., where sufficient thickness of de-saturated/unsaturated aquifer exists and water levels are more than 5 m deep.

Table No. 5.2: Assessment of Dynamic Ground Water Resources of Gondia - 2024

Sr no.	District	Assessment Unit Name	Total Geographic Area (Ha)	Total Recharge Worthy Area (Ha)	Recharge from Rainfall Monsoon (Ham)	Recharge from Other Sources Monsoon (Ham)	Recharge from Rainfall Non - Monsoon (Ham)	Recharge from Other Sources Non - Monsoon (Ham)	Total Annual Ground Water Recharge (Ham)	Total Natural Discharges (Ham)	Annual Extractable Ground Water Resource (Ham)
1	GONDIA	TIRORA	52133.26	52133.26	4022.90	1209.40	72.80	2590.20	7895.30	645.00	7250.30
2	GONDIA	AMGAON	35689.05	35689.05	3236.80	687.90	93.60	1024.60	5043.00	252.20	4790.80
3	GONDIA	DEORI	80783.71	80783.71	7891.50	436.40	1.80	496.30	8825.90	458.80	8367.10
4	GONDIA	GONDIA	62169.46	62169.46	5042.30	1031.50	238.00	2416.80	8728.50	607.90	8120.60
5	GONDIA	GOREGAON	41385.44	41385.44	3639.50	535.00	118.30	728.70	5021.40	251.10	4770.30
6	GONDIA	SALEKASA	39296.00	39296.00	4048.10	680.50	89.30	2017.80	6835.70	513.80	6321.80
7	GONDIA	ARJUNI MORGAON	87477.02	87477.02	9239.80	1549.60	2.10	4405.50	15197.10	1125.70	14071.40
8	GONDIA	SADAK ARJUNI	60770.81	60770.81	5559.60	552.60	29.70	2734.30	8876.20	518.10	8358.10

***Ham** stands for hectare-metre and use to measure the volume of water for availability.

Table No. 5.3: Assessment of Dynamic Ground Water Resources of Gondia - 2024

Sr no.	District	Assessment Unit Name	Irrigations Use (Ham)	Industrial Use (Ham)	Domestic Use (Ham)	Total Extraction (Ham)	Annual GW Allocation for Domestic Use as on 2026 (Ham)	Net Ground Water Availability for future use (Ham)	Stage of Ground Water Extraction (%)	Categorization (OE/Critical/Se micritical/Safe)
1	GONDIA	TIRORA	963.50	24.43	1025.2	2013.1	1025.2	5237.2	27.8	safe
2	GONDIA	AMGAON	577.7	28.1	812.3	1418.1	812.3	3372.7	29.6	safe
3	GONDIA	DEORI	813.2	12.1	462.2	1287.5	462.3	7079.6	15.4	safe
4	GONDIA	GONDIA	1611.5	100.7	1042.6	2454.7	1042.6	5365.9	33.9	safe
5	GONDIA	GOREGAON	1250.60	86.00	757.3	2093.9	757.3	2676.4	43.9	safe
6	GONDIA	SALEKASA	884.6	18.2	587.9	1490.7	587.9	4831.1	23.6	safe
7	GONDIA	ARJUNI MOREGAON	1696.6	24.9	715.00	2436.5	715.00	11634.9	17.3	safe
8	GONDIA	SADAK ARJUNI	2383.4	24.2	627.6	3035.2	627.6	5322.9	36.3	safe

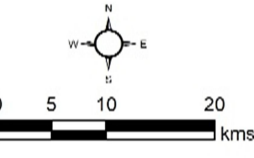
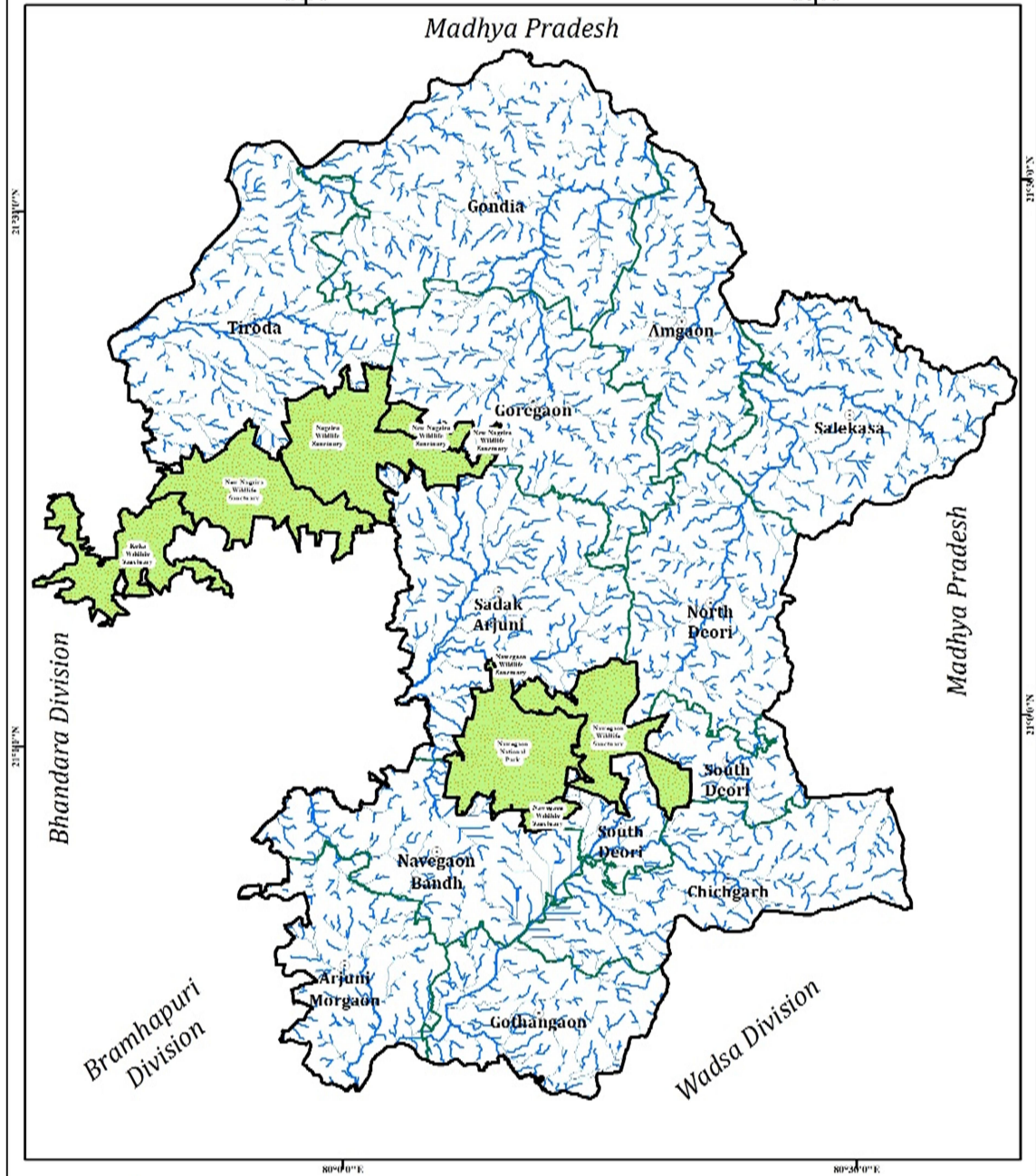
***Ham** stands for hectare-metre and use to measure the volume of water for availability.

Drainage Map of Gondia Forest Division

80°40'0"E

80°34'0"E

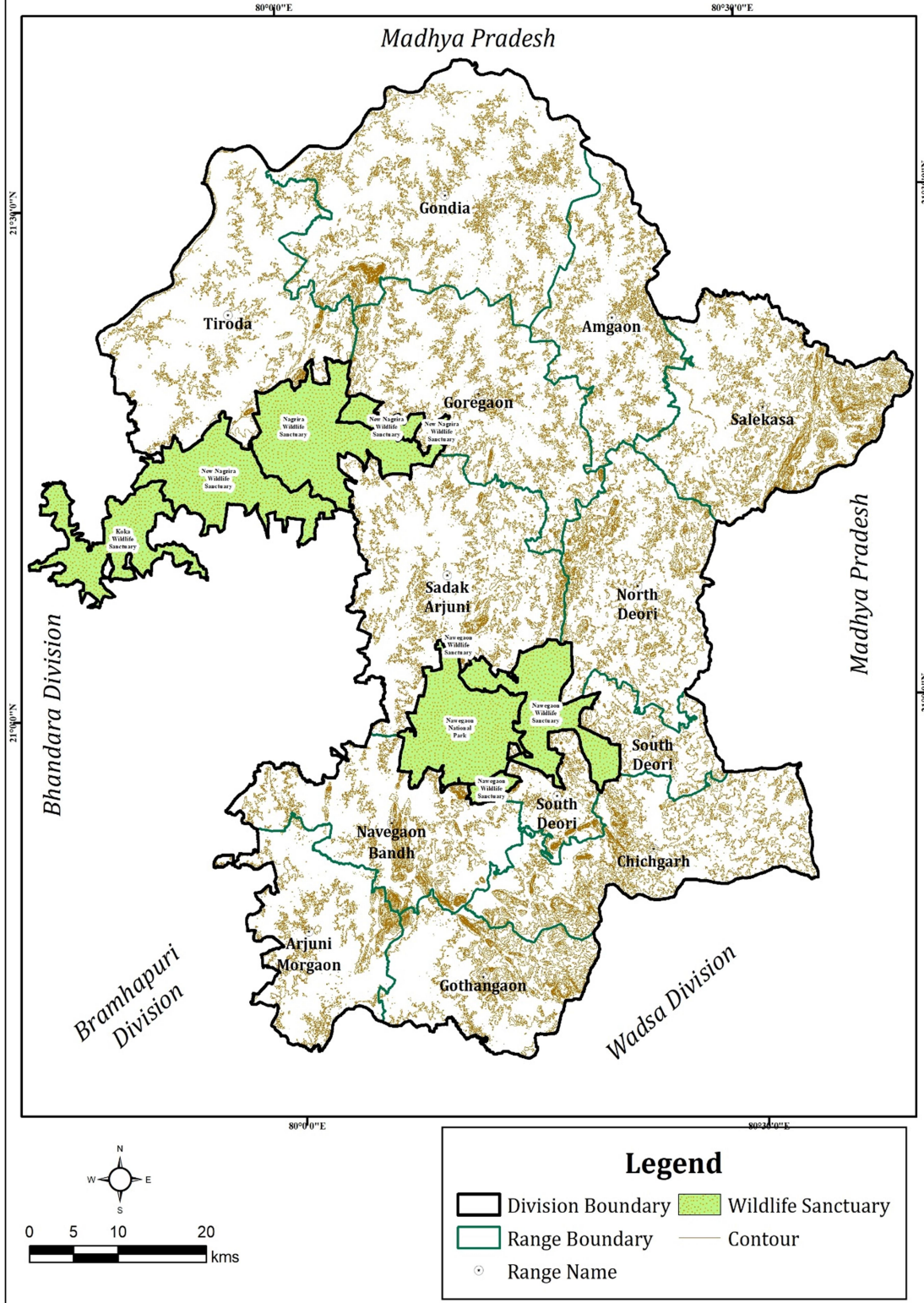
Madhya Pradesh



Legend

- Division Boundary
- Range Boundary
- Wildlife Sanctuary
- Drainage
- Range Name

Contour Map of Gondia Forest Division



CHAPTER 6

MAINTENANCE AND ENHANCEMENT OF FOREST RESOURCE PRODUCTIVITY

6.1 STATISTICS OF RATE OF GROWTH OF TEAK: Exercise of Stem analysis was carried out recently in the Tiroda Range of Gondia Division by office of Chief Conservator of Forests, Working Plan, Nagpur, while preparing the working plan of Bhandara Division to calculate the growth and yield of teak and some other important species.

Stem Analysis of Teak III: Site Quality III is found in very few patches of the Gondia division. The work was carried out in the compartment No. 63 PF of Tiroda range and its result applied for Gondia division and reproduced in the Table 6.1.

Table No. 6.1 Results of Stem Analysis for Teak Site Quality III

Sr. No.	Age in Years	Height in Meters	DBH (ob) in cm.	GBH (ob) in cm.	Volume in M ³ .	CAI in M ³ .	MAI in M ³ .
1	10	4.25	3.50	11.00	0.001	0.0001	0.0001
2	20	8	8.00	25.14	0.012	0.0011	0.0006
3	30	11.2	16.70	52.47	0.037	0.0025	0.0012
4	40	13.6	26.20	82.32	0.125	0.0088	0.0031
5	50	15.5	31.80	99.92	0.312	0.0187	0.0062
6	60	16.7	35.30	110.91	0.543	0.0231	0.0091
7	70	18.2	37.00	116.25	0.721	0.0178	0.0103
8	80	19.4	38.50	120.97	0.924	0.0203	0.0116
9	90	20.6	40.90	128.51	1.072	0.0148	0.0119
10	100	21.7	42.60	133.85	1.158	0.0086	0.0116
11	110	22.5	44.10	138.56	1.214	0.0056	0.0110

The CAI/MAI curves for Teak III intersect at 99 years of age and girth (OB) corresponding to this exploitable age is 134 cm. The exploitable girth is hence fixed at 135 cm.

6.2 GROWING STOCK OF BAMBOO

The growing stock has been considerably damaged due to over harvesting, frequent fires, illicit cutting and over grazing. The irregular working has resulted in extensive damage to the Bamboo clumps at places, and shrinkage of the Bamboo area over the years. Approachable areas have been heavily exploited and the interior clumps suffer from

congestion. Many of the successful plantations have not been worked leading to deformation and congestion of clumps.

The abstract of range wise bamboo area distribution is shown in the following table.

Table No. 6.2 Range wise Bamboo Area Distribution

Range	No. of Comptts.	Area (Ha.)	Area under Bamboo Plantations (Ha.)
Tiroda	03	338.83	0
Gondia	01	10.000	225.00
Goregaon	02	473.354	220.00
Amgaon	00	00	80.00
Salekasa	28	5632.159	145.00
North Deori	4	691.789	00
South Deori	11	2351.343	00
Chichgarh	33	7785.738	00
Sadak Arjuni	05	1150.203	15.00
Nawegaon bandh	24	6071.952	81.00
Gothangaon	31	8003.09	25.00
Arjuni Morgaon	03	863.460	1125.00
Total	145	33371.918	1916

6.3 INCREMENT IN VOLUME OF IDENTIFIED TIMBER SPECIES

Growth of Miscellaneous Species: Stem analysis of miscellaneous species like Bija, Ain, Dhaoda in site quality III and IV areas was carried out by the CF, Working Plan, Nagpur by selecting sample trees form different sites of the division. The results of this exercise are given in the following table.

6.3.1 Results of Stem Analysis for Bija Site Quality III.

Compartment No. 108 RF and 204 RF of Tiroda and Sakoli Range Respectively

Table No. 6.3 Stem Analysis Results of Bija III

Sr. No.	Age in Years	Height in Meters	DBH(ob) in cm.	GBH(ob) in cm.	Volume in M ³ .	CAI in M ³ .	MAI in M ³ .
1	10	1.37	3.51	11.03	0.0007	0.0001	0.0001
2	20	3.70	6.55	20.58	00031	0.0002	0.0002
3	30	7.20	12.50	39.28	0.0134	0.0010	0.0004
4	40	10.15	18.05	56.71	0.0425	0.0029	0.0011
5	50	12.70	24.45	76.82	0.1081	0.0066	0.0022
6	60	15.20	30.40	95.52	0.2232	0.0115	0.0037
7	70	16.15	36.75	115.47	0.4219	0.0199	0.0060
8	80	19.60	38.70	121.60	0.6204	0.0199	0.0078
9	90	21.65	39.80	125.05	0.8754	0.0255	0.0097
10	100	22.85	40.70	127.88	1.0790	0.0204	0.0108
11	110	24.50	42.00	131.96	1.2006	0.0122	0.0109
12	120	25.00	43.00	135.11	1.3145	0.0114	0.0110

The CAI/MAI curve intersects at 118 years of age and the girth (OB) corresponding to this exploitable Girth is 134 cm. The exploitable girth is hence fixed at 135 cm.

6.3.2 Stem Analysis of Bija for Site Quality IV

Compartment No. 108 RF of Tiroda Range

The CAI/MAI curve intersect at 89 years age girth (OB) corresponding to this exploitable Girth is 120 cm. The exploitable girth, hence is fixed at 120 cm.

Table No. 6.4 Results of Stem Analysis for Bija Site Quality IV

Sr. No.	Age in Years	Height in Meters	DBH (ob) in cm.	GBH(ob) in cm.	Volume in cum.	CAI in M ³ .	MAI in M ³ .
1	10	1.37	3.50	11.00	0.0050	0.0005	0.0005
2	20	4.34	5.15	16.18	0.0049	0.0000	0.0002
3	30	8.72	12.47	39.18	0.0295	0.0025	0.0010
4	40	12.64	18.74	58.88	0.0941	0.0065	0.0024
5	50	14.95	24.92	78.30	0.2334	0.0139	0.0047
6	60	15.40	31.34	98.47	0.5016	0.0268	0.0084
7	70	17.74	35.30	110.91	0.7682	0.0267	0.0110
8	80	19.15	37.55	117.98	0.9427	0.0175	0.0118
9	90	20.34	38.70	121.60	1.0689	0.0126	0.0119

6.3.3 Stem Analysis of Saja (Ain) For Site Quality IV

Compartment No. 204 RF and 63 PF of Sakoli and Tiroda range

Table No. 6.5 Results of Stem Analysis for Ain Site Quality IV

Sr. No.	Age in Years	Height in Meters	DBH (ob) in cm.	GBH (ob) in cm.	Volume in m ³ .	CAI in m ³ .	MAI in m ³ .
1	10	1.37	2.75	8.64	0.001	0.0001	0.0001
2	20	7.32	6.71	21.08	0.0017	0.0001	0.0001
3	30	12.59	12.48	39.21	0.0136	0.0012	0.0005
4	40	15.54	19.19	60.29	0.0556	0.0042	0.0014
5	50	17.35	25.16	79.05	0.1458	0.0090	0.0029
6	60	18.25	31.20	98.03	0.3003	0.0155	0.0050
7	70	19.25	35.77	112.39	0.4689	0.0169	0.0067
8	80	20.38	38.64	121.41	0.6110	0.0142	0.0076
9	90	21.17	40.18	126.25	0.7376	0.0127	0.0082
10	100	22.36	41.3	129.76	0.8291	0.0091	0.0083

The CAI/MAI curve intersect at 100 years age, girth corresponding (OB) to this exploitable girth is 129 cm. The exploitable girth is hence fixed at 120 cm.

6.3.4 Stem Analysis of Dhaoda for Site Quality IV

Compartment No. 312 RF of and Paoni Range

Table No. 6.6 Results of Stem Analysis for Dhaoda Site Quality IV

Sr. No.	Age in Years	Height in Meters	DBH (ob) in cm	GBH (ob) in cm	Volume in cum.	CAI in cum.	MAI in cum.
1	10	2.65	1.72	5.40	0.0015	0.0002	0.0002
2	20	7.54	7.34	23.06	0.0024	0.0001	0.0001
3	30	10.37	12.25	38.49	0.0165	0.0014	0.0006
4	40	13.28	17.15	53.89	0.0578	0.0041	0.0014
5	50	15.24	21.32	66.99	0.1319	0.0074	0.0026
6	60	16.32	26.50	83.26	0.2311	0.0099	0.0039
7	70	16.94	28.45	89.39	0.3162	0.0085	0.0045
8	80	17.31	29.52	92.75	0.3864	0.0070	0.0048
9	90	17.52	30	94.26	0.4235	0.0037	0.0047

The CAI/MAI curve of Dhaoda site quality IV intersect at 88 years of age girth (OB) corresponding to this, exploitable age is 93 cm. The exploitable girth is hence fixed at 90 cm.

6.3.5 The growth data of Garadi, Tinsa, Bel, Lendia, Khair, Rohan and Salai obtained from various working plans of neighboring Division is reproduced below.

Table No. 6.7 Table Showing year and Girth of Misc. Species

Age in years	Mean Girth (OB) ate breast height in cm for species						
	Garadi	Tinsa	Bel	Lendia	Khair	Rohan	Salai
10	16.7	12.7	19.1	15.7	10.0	13.7	9.8
20	26.4	25.4	28.2	28.7	24.0	25.4	12.4
30	35.4	35.8	33.5	33.0	38.0	34.3	(23.0)
40	40.9	(43.0)	(37.2)	38.1	51.0	(38.0)	(30.3)
50	44.00	(48.0)	(39.2)	40.6	65.0	(40.0)	*(38.3)

*The figures in the brackets are obtained by extrapolation

6.3.6 Local Volume Tables:

(i) The following Local volume table for Teak, Ain, Bija, Dhaoda and Garadi has been applied for Nagpur Forest division. Gondia Forest division is adjoining to the division; hence it will be applied to this division. The Local volume table is given in Table 6.8

Table No.6.8 Local Volume Table for Teak, Ain, Bija, Dhaoda and Garadi (IVA Quality)

Girth Class (cms)	Mid-girth (cms)	Volume per Tree in Cubic Metres		
		Teak	Ain, Bija, Dhaoda and Tendu	Garadi
16-30	23	0.0166	0.0185	0.0134
31-45	38	0.034	0.0374	0.0272
46-60	53	0.0784	0.0862	0.0627
61-75	68	0.1483	0.1631	0.1186
76-90	83	0.2437	0.2681	0.195
91-105	98	0.3646	0.4011	0.2917
106-120	113	0.5111	0.5622	0.4089
121-135	128	0.6831	0.7514	0.5465
136-150	143	0.8806	0.9687	0.7045
Over 150	158	1.1036	1.214	0.8829

(ii) Local volume table for few miscellaneous species has been prepared by the staff of Working Plan Division Nagpur. The field data for this has been collected from Ramtek and Deolapar ranges of Nagpur (T) division is given in

Table No. 6.9 Local Volume Table for Other Miscellaneous Spp

Girth Class (cms)	Shisham	Surya	Haldu	Kumbhi	Khair	Babul	Mowai	Shiwan	Beheda
	Volume (M ³)								
10-20	0.060	0.18	0.05	0.16	0.04	0.075	0.025	0.005	0.15
20-30	0.180	0.36	0.15	0.36	0.1	0.163	0.075	0.05	0.4
30-40	0.58	0.82	0.3	0.56	0.26	0.5	0.3	0.31	0.7
40-50	1.34	1.62	0.5	0.98	0.62	1.31	1.375	0.94	1.15
50-60	2.54	2.76	1.1	1.76	1.2	3.125	-	2.2	1.8
60-70	4.9	4.66	2.25	2.98	2.08	-	-	-	2.55
70-80	-	-	4.4	4.58	4.6	-	-	-	3.5

6.3.7 Enumeration

- The enumeration of trees and the regeneration survey of the forest crop in the division is carried out by Forest Resources Survey Unit, Amravati. The sampling design was systematic line-plot survey and the intensity of sampling was 1(one) percent.
- Systematic line-plot sampling was carried out at the intersections of 600-meter grid. Species and girth distribution (15 cm girth classes) of trees counting were done in 0.36-hectare plots (60-meter x 60 meter).
- Regeneration count of seedlings and coppice shoots of teak and other miscellaneous species was done in three height classes (0.3 to 1.0; 1.0 to 3.0 and above 3.0 meters) in 0.04-hectare (20-meter x 20 meter) sub-plots.
- Recording of forest types, site quality, density have been included as an integral part of the enumeration exercise.
- Enumeration data was analysed and enumeration results have been computed separately for each working circle. Stem density, basal area and frequency of each species have been calculated. The results of enumeration and regeneration for various working circle compartment wise are given in **Appendix – XX**.

6.3.8 Statistics of Rate of Growth of Teak, and Miscellaneous Species:

(A) Growth of Teak :

- Stem Analysis:** In the Patil and Sardar's plan the growth data for teak was compiled from stem analysis of 65 trees. Twenty-eight of these trees fall in all India quality III and 37 in quality IV. The results of stem analysis are reproduced below.

Table No. 6.10: All India Teak Site Quality III

Age in years	Height In Mts.	Diameter O.B. at Breast height cm.	Girth O.B at Breast height cm.	MAI M ³	CAI M ³
10	5.5	5.5	17.3	0.0005	0.0005
20	11.25	14.5	45.6	0.00325	0.0060
30	15.25	22.0	69.1	0.00683	0.0140
40	18	28.4	89.3	0.01062	0.0220
50	20	33.6	105.6	0.0133	0.0240
60	21.5	37.5	117.9	0.01483	0.0225
70	(22.25)	(40.3)	126.7	0.01557	0.0200
80	(22.8)	(41.8)	131.4	0.01568	0.0165
90	(23)	(42.5)	133.6	0.01555	0.0145

Table No. 6.11: All India Teak Site Quality IV

Age in years	Height in Mts.	Diameter O.B. at Breast height cm.	Girth O.B.	MAI M ³	CAI M ³
10	5.5	3.2	101	0.0003	0.0003
20	7.5	8.6	27	0.0011	0.0019
30	10.5	13.3	41.8	0.002083	0.00405
40	12.7	18	56.6	0.0030	0.00575
50	14.2	22	69.1	0.00416	0.0088
60	15.5	25.5	80.1	0.0051	0.0098
70	16.3	29	91.1	0.00594	0.0110
80	17	31.6	99.3	0.00666	0.0117
90	17.4	34	106.9	0.00745	0.01375
100	17.7	36	113.1	0.008125	0.01420
110	(18)	38	119.4	0.008636	0.01375
120	(18.1)	39.5	124.1	0.008958	0.0125
130	(18.2)	(41)	(128.9)	0.00915	0.01145
140	(18.2)	(42)	(132)*	0.00921	0.0100

*The figures in the brackets are based on extrapolation of the curves. From the above tables following conclusions can be drawn.

(a) All India Quality III:

- (i) The areas capable of growing sound trees up to 23 m in height and 42.5 cm diameter over bark at breast height in 90 years.
- (ii) The CAI and MAI curves intersect at the age of 82 years.

(b) All India Quality IV:

- (i) The areas are capable of growing sound trees up to 18.20m in height and 42.0 cm in diameter over bark at breast height in 140 years.
- (ii) The CAI and MAI curves intersect at the age of 145 years.

The teak trees falling in quality IV were mostly, from hilly and poor areas. Also, they had grown under adverse conditions and had suffered suppression at various periods for want of proper treatment. It will attain a diameter of 38.2 cm (girth 120 cm) over bark at breast height in 90 years, with proper treatment.

Teak Plantations: The growth data of Teak plantations compiled by Patil and Sardar is reproduced below:-

Table No 6.12. Age Girth Relation of Teak Plantation

Age in Years	Height (Mt.)	G.B.H. (O.B) (cm.)
10	9.06	34.8
20	14.7	57.5
30	18.57	79.3
40	26.67	100.4

The above table shows that -

- (i) Teak plantations on an average are of quality III.
- (ii) The height and girth increment during young age is much faster in teak plantations compared to the growth of teak trees in natural teak forest of quality III.

(B) Growth of Miscellaneous Species:

- (i) **Growth of Bija:** Results of stem analysis of Bija by Patil and Sardar are reproduced below:-

Table No. 6.13 Result of Stem Analysis of Bija IV B

Age in Years	Height at Breast height in mts.	D.B.H(O.B.) in cm.	G.B.H. (O.B) in cm.	MAI M ³	CAI M ³
10	3	4	12.6	0.0002	0.0002
20	5.9	10	31.4	0.00075	0.0013
30	8.5	15.7	49.3	0.00183	0.004
40	11.1	20.9	65.7	0.00325	0.0075

50	13.3	25.9	81.4	0.00474	0.0107
60	15.6	30.8	96.8	0.00642	0.0148
70	17.7	35.2	110.6	0.00854	0.0213
80	19.8	38.8	121.9	0.00985	0.019
90	(21.8) *	41.2	129.5	0.01	0.0112

*The figures in the brackets are based on extrapolation of the curves.

On the basis of above table, it can be concluded that -

- The areas capable of growing sound trees upto 21.8 m in height and 41.40 cm in diameter and 130 cm. girth (OB) at breast height in 90 years.
- The CAI and MAI curves intersect at 91 years.

(ii) Growth of Ain: Growth data of Ain as given in the working plans of Gondia, East Chanda and Noth Khandwa (M.P.) written by Patil and Sardar, Kartar Singh and Nigam respectively, are reproduced in Table No.8.14

Table No. 6.14 Age Girth Relation of Ain in Different Divisions

Age in Years	Mean Girth O.B. at Breast Height in cms.		
	Gondia	East Chanda	North Khandwa
10	11.9	11	16.5
20	26.7	21	29.5
30	38.5	30.0	40.6
40	50.3	39	45.7
50	59.7	49.	48.3
60	(70)	58.0	0
70	(80.0)	67.5	0
80	(91)	78	0
90	(102)	88	0
100	(112) *	99	0

*The figures, in the brackets are obtained from extrapolation.

(iii) Growth of Bhirra: Growth data of Bhirra obtained from various working plans is reproduced below: -

Table No. 6.15 Table Showing Age - Girth Relation of Bhirra in different Divisions

Age in Years	Mean girth O.B at breast height in cm. As per W.P. of		
	Nagpur	East Chanda	North Khandwa
10	7.5	7.5	16.0
20	17.6	16.0	27.9
30	30.2	24.0	39.6
40	45.3	30.0	55.0

50	61.6	37.0	70.0
60	74.2	43.0	83.0
70	86.7	51.0	95.0
80	96.8	59.0	105.0
90	104.3	67.0	113.0
100	118.9	75.0	121.0

(iv) **Growth of Dhaoda:** The growth data of Dhaoda obtained from different working plans is reproduced below: -

Table No .6.16 Table Showing Age-Girth Relation of Dhaoda in Different Divisions

Age in Years	Mean girth O.B at breast height in cm. as per W.P. of Dr. Nandkishore		
	Gondia	East Chanda	Indore
10	11.0	0	11.0
20	24.5	26.4	21.0
30	33.5	0	31.5
40	39.6	45.0	42.0
50	43.7	52.5	50.0

(v) **Growth of Other Misc. Species:** Growth data of Garadi, Tinsa, Bel, Lendia, Khair, Rohan and Salai obtained from various working plans is reproduced below: -

Table No. 6.17 Table Showing Age-Girth Relation of Some Misc. Spp

Age in years	Mean Girth O.B. at Breast Height in cm. for specific years						
	Garadi	Tinsa	Bel	Lendia	Khair	Rohan	Salai
10	16.7	12.7	19.1	15.7	10.0	13.7	9.8
20	26.4	25.4	28.2	28.7	24.0	25.4	12.4
30	35.4	35.8	33.5	33.0	38.0	34.3	(23.0)
40	40.9	(43.0)	(37.2)	38.1	51.0	(38.0)	(30.3)
50	44	(48.0) *	(39.2)	40.6	65.0	(40.0)	(38.3)

*The figures in the brackets are obtained by extrapolation.

6.3.9 Stock Mapping: During the course previous plan preparation, stock mapping was done by territorial staff of Gondia Forest Division.

With help of GIS compatible Software entire data pertaining to watershed, soil, Classified scene of vegetation, road, range, beat, division boundaries, stock maps, important features like village, tank, rest houses, headquarters of range, round beats, Tahsils etc. have

been digitised and maintained in the form of different layers. The digital data related to forest have been analysed to get the extent of area and other features to arrive at the fixation of different working circles. These digital maps are meant only for Forest Management purposes and not for any legal disputes or court cases etc.

For this working plan, no new stock maps are prepared. The previous management maps provided already will be continued to be used by the division. Coupe no. XI in the management map should be treated as coupe no. I and sequence to be followed.

6.3.10 Annual Yield: The annual out turn of Forest Produce is given in the **Appendix-XLII**. Based on the past workings, the Form Factors will be prescribed for calculating the yield.

6.4 EFFORTS TOWARDS ENHANCEMENT OF FOREST PRODUCTIVITY THROUGH QUALITY PLANTATION ACTIVITIES

During the period of the Plan there has been no special occasion where quality plantation activities other than the usual plantation carried out year after year. Plantations using the latest technology in terms of high-tech nurseries for raising quality planting material, drip irrigation, chain-linked fencing etc. could be tried for specific need-driven plantations in Gondia forest division.

6.5 CARBON STOCK

Forests play an important role in combating climate change. In addition, it has the potential to provide ecosystem services, such as carbon storage. As per estimation based on India State of Forest Report (ISFR), 2023, the Gondia district forest holds an average of 95.76 tonnes/ Ha carbon.

6.6 CARBON SEQUESTRATION AND MITIGATION

This plan proposed a separate working circle for Afforestation. The area under Afforestation Working Circle will be treated/regenerated under natural regeneration. This will add to the forest cover of the district and contribute significantly to the carbon sequestration of the forest & forest plantation. Natural regeneration will add Biomass & carbon in form of the vegetation due to protection. As the Plan prescribes for the controlled opening of the canopy under SCI Working Circle, the growth of young crops because of this opening will boost the Carbon sequestration from the atmosphere as young crop sequester more carbon.

CHAPTER 7

OPTIMIZATION OF FOREST RESOURCE UTILIZATION

7.1: RECORDED REMOVAL OF TIMBER

During the past Plan period, working circle wise estimated yield and actual obtained yield is shown in following tables.

Table No. 7.1: Working Circle wise Estimated, Obtained Yield

(Coupe No. I to X)

SCI WORKING CIRCLE

Year	Coupe No	Working Circle	Total area of the coupe	Area Felled of Ha	Estimated Yield				Actual Yield			
					Timber (Cum)	Poles (Cum)	FW Beat	Total ((Cum)	Timber (Cum)	Poles (Cum)	FW Beat	Total (Cum)
2013-14	I	SCI	3556.184	449.535	501.984	0	616.00	1117.984	0.00	0.00	0.00	0
2014-15	II		3355.819	212.800	279.814	0	703.00	982.814	196.458	0	1341.00	1537.458
2015-16	III		3244.521	656.270	1017.682	0	1558.00	2575.682	915.512	0	4260.00	5175.512
2016-17	IV		3485.798	1479.530	3394.369	0	5269.00	8663.369	3072.727	0	5904.50	8977.227
2017-18	V		3250.832	885.705	2097.104	535	4697.00	7329.104	2803.602	0	4999.50	7803.102
2018-19	VI		3229.84	335.960	1239.	5681	2421.00	9341.364	989.637	0	2934.05	3923.687
2019-20	VII		3329.344	208.780	1107.08	0	309.63	1416.71	478.400	0	1775.50	2253.900
2020-21	VIII		3293.81	486.710	3366.239	0	6837.45	10203.689	2201.136	0	7676.00	9877.136
2021-22	IX		3374.908	727.253	5308.270	0	2962.377	8270.647	0.000	0	0.00	0
2022-23	X		3318.919	536.819	6982.968	0	2660.98	9643.948	4877.834	0	14183.5	14183.5
Total			33439.975	5979.362	25294.51	6216	28034.437	59545.311	15535.306	0	43074.05	53731.522

IWC WORKING CIRCLE

Year	Coupe No	Working Circle	Total area of the coupe	Area Felled of Ha.	Estimated Yield				Actual Yield			
					Timber (Cum)	Pole (Cum) Nog	FW Beat	Total (Cum)	Timber (Cum)	Poles (Cum)	FW Beat	Total (Cum)
2013-14	I	IWC	1103.07	149.853	0	0	0	0	0	0	0	0
2014-15	II		1059.75	473.477	0	0	0	0	0	0	0	0
2015-16	III		1086.1	301.186	406.381	20.00	1489.000	1915.381	300.967	0	3251.000	3551.967
2016-17	IV		1057.58	197.543	879.385	57.00	903.000	1839.385	561.783	2.00	1813.000	2376.783
2017-18	V		1097.14	179.085	209.287	53.00	865.000	1127.287	23.593	293.00	344.850	661.443
2018-19	VI		1133.52	67.800	272.204	850.00	266.000	1388.204	104.899	15.00	1346.000	1465.899
2019-20	VII		1133.52	100.318	101.045	0.00	196.345	297.390	66.370	0	351.000	417.370
2020-21	VIII		1133.52	96.371	0	0.00	0	0	0	0	0	0
2021-22	IX		1266.14	233.321	790.959	0.00	1760.424	2551.383	0	0	0	0
2022-23	X		1177.766	112.00	554.59	0	336.35	890.879	302.066	2008	1443.00	1745.066
Total			11248.106	1910.954	3213.851	980	5816.119	10009.909	1359.678	2318	8548.85	10218.528

AWC WORKING CIRCLE

Year	Coupe No	Working Circle	Total area of the coupe	Area Felled of Ha.	Estimated Yield				Actual Yield			
					Timber (Cum)	Poles (Cum) Nog	FW Beat	Total (Cum)	Timber (Cum)	Poles (Cum)	FW Beat	Total (Cum)
2016.17	IV	AWC	1611.299	70.875	92.573	134.00	205.000	431.573	61.578	579.00	108.50	749.078

7.2: RECORDED REMOVAL OF FUEL WOOD

Annual out-turn of Timber and fuelwood and revenue realized is shown in **Appendix No.XLII**.

7.3: RECORDED REMOVAL OF BAMBOO/RATTANS

The details of Bamboo harvesting during last ten years are given in **Appendix No. XLVII**.

7.4: RECORDED REMOVAL OF LOCALLY IMPORTANT NTFPs INCLUDING MAPs

The important non-Forest produce that are removed and recorded from the forest are Tendu, Moha and gum. The other NTFPs and medicinal and aromatic plants that are removed from the forest appear to have not been recorded.

The biggest source of NTFP produce that the Division harvests is tendu. During the past ten year (2013-2024) the quality of tendu removed is 285146.497 standard bags amounting to Rs. 1064449708.

The other species of NTFP for the Division is the gum tree which is mostly *Sterculia urens*, *Boswellia serrata*, *Anogeissus latifolia*, *Accacia spp* etc. The collection has not been regular except in the year 2013 to 2024 when about 9692.74 quintals of gum was extracted providing a revenue of about Rs. 1204410. The details are given in **Appendix No.XLIII**.

7.4.1 MANAGEMENT OF TENDU:

Collection of Tendu Leaves: Tendu is the prominent revenue generating NTFPs of this tract. Tendu leaves are used for manufacturing bidis. Tendu trade has been nationalized by the Govt. of Maharashtra Act No. LVII of 1969. Tendu leaves were collected by the department through agents till 1990 season. During the 1991 season Tendu units were sold on lump sum basis. The area of Gondia Division divided into 29 groups of units. The collection of Tendu leaves commences from the last week of April each year and continues up to first week of June. Quality of leaves is a major criteria for bidi manufacturers. The quality depends on the colour, texture and presence of nodules and veins. The best quality leaves are those ranging

from ashy to palest hue; Almond colour is also prized shade. Leaves with leathery texture either too thick or thin are good quality for making Bidi. The leaves are collected at various collection centers called phadies. The leaves (pudas) are dried and then packed in gunny bags. The quantity is measured in standard bags.

1. Tendu leaf collection is the monopoly of the State Government under the Maharashtra Minor Forest Produce (Regulation of Trade) Act, 1969. The Tendu leaf collection shall be carried out in the manner prescribed by the Principal Chief Conservator of Forests Maharashtra State, Nagpur from time to time.
2. Tendu leaf collection is an income generating activity for most local and tribal villages in the region. The local village communities shall be gainfully engaged in Tendu collection in the Division to support their livelihood. Revenue Realized from tendu leaves collections in the last ten years in Gondia Division have been given in the **Appendix No. XLVI**.
3. A-1 type areas in working circles should be excluded from Tendu units. Tendu leaves shall not be collected from buffer area surrounding the special habitats of wildlife & in the buffer zone of national parks & wildlife sanctuary.
4. Pruning of young Tendu plants does help in increasing leaf yield. Saplings having less than 5 centimeters collar diameter shall not be pruned. However, felling of Tendu trees or branch lopping for leaf collection should be dealt with firmly.

7.4.2 MANAGEMENT OF MAHUA:

A. Mahua Collection: There is substantial number of Mahua trees in the crop. Inventory of Mahua trees shall be made to have an idea of its production potential and regeneration status. The villagers in the tract have local system for allocation of collection rights of Mahua flowers and fruits. In view of the viability of traditional of allocation of collection rights by the local communities no intervention is warranted in the process of Mahua collection. For better protection of Mahua trees and to increase its stock, few Mahua trees should be numbered and these trees be allotted to members of JFM committee. The members of committees who have been assigned with job of protection & nurture of Mahua trees, they should protect them from fire. Range Forest Officer is supposed to monitor this activity of JFM committee regularly and make proper documentation.

B. Mahua Regeneration: It is prescribed to provide soil working along with other planted seedling during coupe operation of area-specific working circles. Mahua will be one of the species in mixed plantation. Seedlings of Mahua, raised during the previous season i.e., 15

months old, should only be planted in the mixed plantation schemes.

7.4.3 MANAGEMENT OF GUMS: Gum is an important NTFP and is exuded by plants, partly as normal phenomenon and partly as the result of disease or injury to the bark. Wood Gum is a substance of more or less sticky nature. The Kullu (*Sterculia urens*), Dhaoda (*Anogeissus latifolia*), Salai (*Boswellia serrata*) and Acacia (*Acacia nilotica*) are main sources of gums in the area. These gums are used in medicines, chemicals, cosmetics, food industries and incense. Indian Gum, Arabic or babul gum is from *Acacia nilotica* and is of great commercial importance. The gum is used in calico printing, dyeing and as a sizing material for silk and cotton and in the manufacturing of paper. Salai gum is mostly used in the Indian medicines for the treatment of rheumatism and nervous diseases. Salai gum has the potential of becoming mounting media by substituting imported Canada balsam in the preparation of microscopic slides. Keella & Dhaoda gum are used in food industry for making sweets. It may also be suitable in the manufacture of elastic adhesive, lacquers, oilcloth compositions, ink and perfumery. Revenue Obtained from Gum Collections in the last ten years in Gondia Division have been given in the **Appendix No. XLIII**.

Formation of Gum Units: The gum units for collection of Dhaoda and Salai gums are formed and well demarcated, range as a unit, they are coterminous with protection ranges which ensure effective monitoring and control. Besides, Kullu and Salai saplings are prescribed to be provided soil working along with planted seedlings in various area-specific working circles, after field inspection & their assessment. Singling and tending of Salai shoots would further help the Salai regeneration. Gum-yield species are prescribed for plantations.

7.4.4 Management of Hirda, Beheda, Aonla, Char and Other NTFP Collection of Hirda, Beheda, Aonla, Char and other NTFPs: Fruits of Hirda, Beheda, Aonla and Char are marketable items. Similarly, fruits, flowers and leaves of certain shrubs and trees are used for variety of purposes. Current level of collection is quite erratic and, therefore, poor indicator of their potential in the tract.

Collection of species, which are not covered under the monopoly procurement by government agencies, should be allowed by the Joint Forest Management Committees or Village Panchayats for better protection of Hirda, Beheda, Aonla, Char trees and to increase its stock, few of the above trees are numbered and these trees be allotted to members of JFM committee. The members of committees who have been assigned with job of protection & nurture of above trees, they should protect them from fire. Range Forest Officer is supposed to monitor this activity of JFM committee regularly and make proper documentation.

If these village bodies are not interested in collection, the collection rights may be auctioned. Collection units shall be co-terminus with the protection ranges.

Removal of NTFPs shall be within the sustainable limits of production. Felling of trees and lopping of branches shall not be permitted for collection of NTFPs. Destructive removal shall not be permitted, in any case. Digging up of plant roots, branch cutting, debarking on a plant will be considered as destructive removal.

7.4.5 MANAGEMENT OF GRASS:

The common grasses are Kusal, Bhurbhusi, Ghonad, Sheda and Marvel. Coarse grasses are used for thatching and palatable grasses for stall feeding. The demand for grass is local. For fodder Marvel, Sheda, Paonya and Mushan are preferred. Some villagers also collect Broom grass (Jhadu gavat). Broom grass may be propagated in the suitable areas.

The demand for grazing is very heavy in some area of this division, aiming to provide good grazing site to the local cattle without deterioration of the productive capacity of the site. The quantity of fodder can be improved by introducing superior grasses, legumes and fodder tree species.

7.5 DEMAND AND SUPPLY OF TIMBER AND IMPORTANT NON-TIMBER FOREST PRODUCE

Agriculture customs and wants of the population

Gondia district having geographical area extending over to 5234 sq.km forming about 1.70 percent of the total area of the state. As per 2011 census, the total population of Gondia district is 1322507.

The population density of the district is 253 persons per sq. km. The average literacy rate of the district is 84.95 percent, comprising 69.59 percent for women and 76.98 percent for men.

For administrative purposes Gondia District has been divided into 8 talukas, comprising around 954 villages organized into 8 Panchayat samittees

The urban-rural break up of population reveals 11.95 percent as urban population while 88.05percent forming the rural population. Moreover, 45.22 percent of the population is labourers; and out of this around 76 percent of the labourers are engaged in primary sector such as agriculture and related works.

As mentioned in the previous plan about 71% of the land of total geographical area is cultivable; 4.4% of the total area is under permanent pasture and grazing. The forest area, including, the Zudpi jungles, in charge of the forest department forms 32.02% of the total

geographic area of the district.

Paddy, Pigeon Pea & Oil Seeds are the main kharif crops, whereas, wheat, gram, and groundnut are the main rabi crops grown in the district. Out of the total cultivable land 40% is under cotton, 45% is under food grains and the rest under other crops.

There are over 8 Agriculture Produce Marketing Committees where the agriculturists bring their excess material for sale.

The irrigation facilities in the district are poor. About 70% is through wells and rest of the 30% was by other modes which include small, medium and major irrigation projects/tanks, lift irrigation and through pumps fixed on the bank of nala and rivers. There are 3 major and 18 medium and over 46 minor irrigation projects/tanks, namely; Bodalkasa, katangi, Khirbandha, Nawegaon, Pujaritola,

There are over 292369 households in the district, including 243840 households in rural areas and 48529 households in urban areas. About 1015 villages inhabit in the vicinity of the forest areas; and over 74 percent of the inhabitants of these villages depend on the forests to sustain their livelihood.

The rural population consists mainly of agriculturists and agricultural labourers such as mahars, gonds, kunbis, telis, etc. The way of life of the people in rural areas has direct bearing to the forests as they depend on forests for timber, poles, firewood, bamboo and grasses for constructing their houses and cattle sheds and making agricultural implements. They also require fodder, flowers and fruits as well as variety of other non-timber forest produce such as moha, gum, lac, honey, tendu leaves, herbs, roots etc for food and medicinal purposes

The main forest produce that are harvested from the forests of Gondia division and those which support the livelihood of the people, are given, as under:

(1) Timber: Teak is the most valuable timber of the division. It is used for construction, furniture and various other articles. But due to its prohibitive prices and non-availability in sufficient quantity other species such as Ain, Dhaora, Bhirra, Lendia, Kalam, Dhaman and bamboos are used. The demand is heaviest in the intensively cultivated and rich plains. For the manufacture of carts, Teak is preferred for the body; Tiwas, ain, dhaman, tendu for shaft; dhaora for axles; tiwas, kusum or kahu for naves; teak for spokes and shiwan for yokes. For agricultural implements, such as, plough; tiwas, khair and babul are preferred in that order. Dhaora and Dhaman are used for axe handles and semal for dug outs.

(2) Firewood: There is a great demand for firewood throughout the division. Dhaora, khair, bhirra and ain are valued as firewood. Due to heavy demand inferior firewood of softwood species like salai and mowai is also extracted. Due to increase in small dhabas on the highways and in small township the overall demand for firewood has increased.

(3) Bamboo: Bamboo is available in this division except in few patches of Amgaon ranges which is negligible. It is used for hut constructions and manufacture of household articles.

(4) Grass: Coarse grasses are used for thatching and palatable grasses for stall feeding. The demand for fodder grass depends upon the yield of agricultural crops, such as, jowar stalks, bhusa and paddy straw, which are used as fodder. The demand for grass is local. For fodder marvel, sheda, paoniya and mushan are preferred.

(5) Other forest produce: The other forest produces which the villagers take from the forests are, edible flowers and fruits, fibres from bark and roots, gum, herbs, thorns, and leaves. The main species of edible flowers and fruits are moha, charoli and tendu. Fibres are extracted from palas, palasvel. Thorns of bharati, hiwar, eruni, chilati, ghoti, bor and babul are used. Cordage and lashings are made out from the bark of kuda, palas and sometimes piwarvel. Besides, murum and stones are also removed for building and roads.

7.5.2 : Occupation and Industries

Besides agriculture, there are small occupation/industries in the villages and urban areas which are inter linked with forests; and few of them are given below:

- (i) **Bamboo articles:** Burads make baskets, mats, dholis, etc. from bamboos and sell them locally. However, there are very little natural bamboo areas to meet these demands. Mostly bamboo articles prepared by Burads come from adjoining districts.
- (ii) **Saw mills:** There are 53 saw mills in the Gondia district concentrated primarily at Gondia city which depend on the supply of wood from the forests as well as private areas.
- (iii) **Furniture industry:** There are good numbers of furniture shops in rural and urban areas which use wood and timber from the forest area. Teak is the most prominent species used for the purpose. Furniture industry and carpentry, provide job opportunities to the hundreds of skilled carpenters engaged in furniture making, joinery works house construction etc. In addition, veneer and plywood board

industry requires good quality teak and other miscellaneous species from the forest areas of this division for their sustenance and balanced growth.

- (iv) **Manufacture of bidis:** Tendu leaves are used for preparing bidis by wrapping tobacco in these leaves. It is carried out on in a small scale in the district.
- (v) **Collection of minor forest produce:** The poor class of villagers when not engaged on agricultural works collect moha flowers and fruits, charoli, gum, honey, wax, bark, roots, leaves etc. and sell them locally to supplement their income. Fuelwood and grass are also collected by these people for local selling.

7.6: IMPORT AND EXPORT OF WOOD AND WOOD PRODUCTS

There is no record of the import and export of wood and wood products into or from Gondia. The produce that is produced from Gondia is generally locally consumed.

7.7: IMPORT AND EXPORT OF NTFPs

Nothing on record is available on the import and export of any of the non-timber forests produce from the District of Gondia. This is perhaps because the production of NTFPs in the district is insignificant.

7.8: REMOVAL OF FODDER

Grass from grass birs, closed coupes and a plantation is available on cutting basis. As per the existing Govt. orders annual lease of grass birs for removal of grass on cutting basis, is first offered to Gram Panchayats, Co-operative Milk Societies and other Public Bodies at a price fixed by the Forest Department, considering current market trend and availability of grass. The grass from the areas which remain unsold by any of the above methods is sold on rated passes. In drought years grass from grass birs is kept reserved under the orders of the Collector and is cut and supplied to the drought affected areas.

Due to excessive cattle pressure the site conditions of grass birs have been deteriorated severely; and hence are not in position to meet the demand of the entire division as well as to fulfil objective of producing quality grass in their present shape.

7.9. VALUATION OF THE PRODUCTS:

As mentioned earlier, the main Non wood Forest products that the Division produces are tendu, Moha and gum. The quantity and the revenue generated in the sale of the above products is given below. It may be seen that the quantity of grass and gum is not much and the collection is very irregular. There is a need to streamline the extraction and auction of the

products. The quantity extracted and revenue earned of Gum is given in **Appendix No. XLIII** and Tendu is given in **Appendix No. XLVI**.

CHAPTER 8

MAINTENANCE AND ENHANCEMENT OF SOCIAL, ECONOMIC, CULTURAL AND SPIRITUAL BENEFITS

8.1 NUMBER OF JFM COMMITTEES AND AREA(S) PROTECTED BY THEM

JFM concept has been introduced in this division in the year 1998. So far 364 villages over a period of 15 years have been covered and rest of the villages are under process. The present status of the committee formed in this division is as under:

Table No.8.1 Range wise Area Distribution under JFM Committees

Sr. No	Range	No of villages adjoining to forests	No of JFM committee formed	Area Handed over to committee (in Ha)	No. of villages to be dealt with
1	Tiroda	98	57	6210.399	41
2	Gondia	120	51	6403.914	69
3	Goregaon	76	25	3734.777	51
4	Amgaon	75	25	2633.429	50
5	Salekasa	80	37	8600.0288	43
6	North Deori	55	13	2014.705	42
7	South Deori	55	13	3148.535	42
8	Chichgarh	44	29	5179.136	15
9	Sadak Arjuni	55	45	5927.213	10
10	Nawegaon bandh	48	18	3973.265	30
11	Gothangaon	32	23	3566.824	09
12	Arjuni Morgaon	32	28	3644.340	04
Total		770	364	55037.5658	406

8.2: STATUS OF EMPOWERMENT OF JFMCS

State's JFM is guided by the Govt. of Maharashtra Resolution dated 16th March 1992, 5th October 2011 and 10th July 2012. The number of villages adjoining to forests are 281 and all these villages are covered under JFM and JFM Committees are in place. The total number of members in the Committee are minimum 12 and a maximum of 24 and one-third of the members are to be from the Gram Panchayat. 50% of the members should be women and 2 members should be from SC/ST and OBC. The performance of the Committee in the Division has been adequate. The Forest Development Agency is well established and its working is

satisfactory. Efforts to make the functioning and transaction of funds more and more transparent are going on in the FDA.

8.3: LABOUR WELFARE

The JFM villagers have priority over others in all the activities of the Department for semi-skilled and unskilled labour. Works of plantations, natural regenerations, boundary pillars repairs, fire line cuttings and all other works of the Department are involved through the JFM members wherever Committee exists. Maharashtra also has the unique distinction of having Forest Labour Cooperative Societies in every Division. All skilled works related to felling of trees in the forests are auctioned to these societies.

8.4 USE OF INDIGENOUS KNOWLEDGE

The Department has made its effort in documenting the indigenous technical knowledge of the people in and around the forest. The Territorial wing may arrange for a special drive for documenting the information and it may be added up to this working plan.

8.5: EXTENT OF CULTURAL/SACRED GROVES

There are no sacred groves in the district. The flow of tourists and devotees to these areas are seasonal and days-specific.

8.6: ECOTOURISM AREAS AND ACTIVITIES

The Division have identified important and potential area to be developed for ecotourism in the district. These site area at 15 locations spread in six ranges. There is a need to develop these sites and to document the ecological, cultural, religious significance of each of the area and to formulate a plan by which these sites could become places for forestry extension in the future. These sites are given below:

Table No.8.2 Details Of Eco-Sites And Eco-Circuits In Gondia Division

S. N.	Range	Tourism Place	Distance
1	2	3	4
1	Nawegaon	Mahaveo Pahadi	75 Km
2	Gothangaon	Itiadh Dam	85 Km
3	Arjuni Morgaon	Pratapgarh Shiv Mandir	90 km
4	Goregaon	Mando devi	37 Km
5	Salekasa	Kachrgarh	55 Km
6	Salekasa	Hajara Fall	48 Km

7	Tiroda	Bodalkasa	40 Km
8	Tiroda	Chorkhamara	60 Km
9	Tiroda	Mangezari	25 Km
10	Gondia	Pangli	15 Km
11	Sadak Arjuni	Pitambar tola	70 Km

8.7: SOCIAL CUSTOMS

Social customs relevant to the forest or its conservation are not noticed or known to the Department

8.8: STATUS OF COMPLIANCE OF FOREST RIGHT ACT (FRA)

The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 was passed by the Parliament of India and the assent to this Act was received from the President of India on 29th December, 2006. The said Act was notified in the Gazette of India on 2nd January, 2007. For implementation of the said Act, the Central Government notified the Rules for Recognition of Forest Rights on 1st January, 2008. These Rules were further amended by the Central Government vide notification dated 6th September, 2012.

Table 8.3 Status of Implementation of FRA, 2006

Sr. No.	Type of Claim	No. of Cases	Rights recognised area (in Ha)
1	Individual	9342	5214.88
2	Community	869	40523.882
	Total	10211	45738.762

The status of implementation of this Act (till 2022-23) given in **table no.8.3**. The cases accepted by the district level Committee are 9342 of individual cases & 869 Community claims. As per Under Section 3(2), in 135 cases, a total of 58.48 ha land has been allotted for specified purposes.

8.9: OTHER RIGHTS AND CONCESSIONS

8.9.1 A. Reserved Forests: There were no rights in the Reserved Forests except right to way and access to water. There is no commutation of Nistar or Paidawar in the Gondia Forest Division. Various concessions were granted from time to time to the agriculturist and others by the erstwhile Govt. of Madhya Pradesh and Govt. of Maharashtra. The following concessions were permitted in the past.

- Grazing of cattle belonging to the agriculturists of certain villages, in the vicinity of

the Reserved Forests, in accordance with, the grazing rules in force.

- Agriculturists of villages in the vicinity of the Reserved Forest are given certain quantity of bamboo and firewood for their bona bonafide use at concessional rates. None of these concessions were legal right.

But after the enactment of “The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights), Act 2006” all the rights, recognized under this Act, has to be respected and granted to the eligible persons and communities after following all the legal formalities.

8.9.2 B. Protected Forest: Before the abolition of the proprietary rights all lands belonged to the proprietors. A village administration paper called ‘Wajib-ul-Arz’ was prepared for every settlement; and plots of land were separately recorded, showing the Khasra numbers and area which was set apart for a particular purpose. In order to distinguish between the rights existing on the government waste lands and on the other land, a provision was made in Madhya Pradesh Land Revenue Code, 1957 prescribing the preparation of the Nistar Patrak and Wajib-ul-Arz for every village. The Nistar Patrak deals exclusively with community and customs over private land.

8.9.3 The Nistar enquiry had been conducted in Gondia district during the period 1954-56 and all the villages have been covered under it. The Nistar officers have formed grazing and Nistar zones by clubbing together surplus villages with deficit villages, while self-sufficient villages have been treated as individual zones. Villages assigned to a particular zone can exercise their Nistar rights within that zone.

8.9.4 The classification of the villages into surplus, deficit or self-sufficient for exercise of Nistar rights was made on the following basis:

- i. A village having tree clad area equal to half the occupied area was considered to be self-sufficient.
- ii. A village having tree clad area more than half the occupied area was considered to be surplus village.
- iii. A village having tree clad area less than half the occupied area was considered to be a deficit village.

8.9.5 Grazing: As per the 2003 cattle census, the total cattle population of Gondia district 6.47 lakhs. Out of this, 50 percent are Cows and Bulls; 15 percent are Buffaloes, 24.65 percent are Sheeps, Goats and Horses. Other cattle recorded are 10.01 %. The cattle density is

778 per Sq.km. in 2005. There has been decrease in the cattle population from 1997. Taluka-wise livestock population in Gondia district is given in **Table No. 8.4** below:

Table No.8.4: Taluka Wise Live-Stock Population in Gondia District

Taluka	Cows & Bulls	Buffaloes	Sheeps	Goats	Horses	Other	Total
1	2	3	4	5	6	7	8
Gondia	62796	25589	27	44773	0	0	133185
Arjuni/Mor.	2395	1565	132	0	0	0	4092
Gothangaon	2774	457	0	156	0	0	3387
Nawegaon	2252	715	0	0	0	73	3040
Goregaon	6008	594	0	0	0	0	6602
Amgaon	8700	2205	90	9061	5	0	20061
Chichgarh	9122	745	0	2103	0	0	11970
S Deori	4590	140	0	370	0	1173	6273
N Deori	5954	751	0	1250	0	167	8122
Tirora	10500	3500	0	12000	4	0	26004
Salekasa	26221	6926	92	16222	0	1580	51041
Sa./Arjuni	6757	362	0	637	0	16	7772
TOTAL	148069	43549	341	86572	9	3009	281549

8.9.6 The basis for forming grazing zones was that each head of cattle in the cotton-jowar tract should have 0.4 hectare as grazing land. Villages in which the grazing lands were less than the above requirement were clubbed with the neighbouring village in which such area exceeded the above standard. In villages where grazing land was just sufficient for the needs of the cattle of that village, no rights for persons residing in other villages to graze their cattle have been recognized unless already recorded in the "Wajib-ul-Arz."

8.9.7 Villages clubbed as above constituted a grazing zone. The clubbing of the villages was done in such a way that the villagers were not required to take their cattle to a longer distance than what their cattle can easily cover in a day. Within a specific zone all persons were at liberty to graze their cattle free, until otherwise ordered by the appropriate authority.

8.9.8 The directives contained in the Madhya Pradesh Land Reforms Department's memorandum No.1290-1227-XXVIII, dated 4th September 1953 prohibited grazing by sheep and goats in forests meant for production of big timber and even in the forest areas where villagers generally exercise their Nistar rights. This ban was imposed after considering the severe damage caused by the sheep grazing in the forests. However, subsequent directive from the Government of Maharashtra, vide G.R No.MFP-2103/C.No.135/F-1 Dated 29/10/2007, has allowed grazing by sheep in the forest areas, as per the recommendations of the Grazing Settlement Reports, but continued complete prohibition on grazing by goats in the forests. Following norms of concessional grazing have been prescribed under the Protected

Forests (Vidarbha Area) Rules, 1959:

- a) Cultivators - 2 plough cattle per plough plus 4 others including one she-buffalo.
- b) Agricultural artisans and labourers – 4 cattle including one she-buffalo; provided further that all animals in excess of those specified in 1.13.5 of the directive; Provided that a calf under one year shall not be counted;

Provided further that all the animals, in excess of those specified in clauses (a) and (b), shall be charged at such rates, as the State Government may, from time to time, sanction in this behalf.

8.9.9 Occupational Nistar: In the Nistar Patrak, occupational rights of the Kumbhars, Chambhars, Gonds, Mahars, Parahan and Lohar communities have been recorded and recognised in several villages, having entries in the Wajib-ul-Arz of each village.

As regard other occupational Nistar, Ghost fruits and Dhaoda leaves are allowed to be removed by the charmakers free of charges. They are also allowed to remove Bakul (*Mimusops elengi*), and Kahu/Kullu (*Sterculia urens*) bark on nominal payment from trees marked for felling.

8.9.10 General Nistar: The Nistar is required by the villagers for bona fide domestic and agricultural purposes. Nistar from the forests generally includes timber of certain species and sizes for agricultural implements, houses and cattle sheds, fire woods, bamboo, thatching and fodder grasses, fencing material, bark, fibre, minor minerals and paidawar i.e. edible fruits, flowers and roots, honey wax etc. The rights and concessions are governed by the provisions made in the Nistar Patrak for each village accordingly to which, agriculturists and agricultural labourers are entitled to following kinds of forest produce for their Nistar either free of charge or at concessional rates fixed, from their Nistar zones.

8.9.11 Distribution of Forest Produce Under the Nistar System:

(i) Bamboo: In Gondia Forest Division, there are 3527 families of Burad community. These Burads are dependent upon the forest department for supply of bamboos. The Forest department has issued cards to each family of Burad community and accordingly 1500 Bamboos are supplied to them on concessional rates from the department's Depots.

Dry and Green bamboos are removed as per silvicultural rules and distributed to the local farmers under Nistar and the surplus Bamboos are sold in open public auction.

(ii) Small Timber and Poles: According to the zone arrangement framed by the Nistar Officers, the villagers are entitled to obtain their Nistar requirements of small timber and poles from the available material from the forests included in a particular zone either free or on payment up to a certain quantum fixed by the Collector. In order to meet the demand of the cultivators of the villages which were not included in the zone, the Nistar officers have prescribed that in the event of supply being in excess in a particular zone after meeting the demand of zonal villagers, the excess could be given to persons outside the zone on payment at the rates.

(iii) Firewood: Free removal of firewood from Khasra number set aside for Nistar is permitted as per rights recorded in Nistar Patraks for bona fide use to the villagers. In khasra numbers which are in excess, no such right is allowed. Fire wood is also supplied on Nistar/concessional rates from the forest depots.

(iv) Other Forest Produce: Where thorns are not available, removal of brushwood such as lops and tops of the felled trees are permitted. Removal of thorns and brushwood is allowed free of cost or at nominal rates.

Bark, Fibres and Roots are allowed to be removed where it is customary to allow their removal for cordage. Moha, Char, Tendu or other edible fruits, flowers and roots are allowed to be removed free of cost from all over the forests for domestic consumption.

(v) Nistar Rules: In the Nistar Patrak of each village the khasra numbers set-aside for Nistar and grazing are recorded. The details regarding quantum of Nistar, period during which it is to be allowed, payment if any to be made etc. are given in the Nistar Patrak in general. However, due to heavy encroachments, over harvesting, illicit felling over grazing and fire, these areas have become highly degraded and are no longer able to meet the Nistar requirements of the people. They need immediate rehabilitation through afforestation, soil and moisture conservation and proper management on sustainable basis.

8.10: DEPENDENCY OF LOCAL PEOPLE ON NTFPs

There are no significant number of people/community dependent on the forests and forest produce. The department supplies bamboos to Burad community by acquiring from nearby Forest Division and selling them at concessional rates. The Pardhi community in the District are also dependent on the forests in many ways but their lifestyle needs further study to fully understand their dependency.

8.11: OTHER ASPECTS

The rural population consists mainly of agriculturists and agricultural labourers such as Mahars, Gonds, Kunbis, Telis, *etc.* The way of life of the people in rural areas has direct bearing to the forests as they depend on forests for timber, poles, firewood and Bamboo for constructing their houses and cattle sheds and making agricultural implements. They also require fodder (grasses and other foliage fodder), flowers, fruits, roots as well as variety of other non-timber forest produce such as Moha, gum, lac, honey, Tendu leaves, herbs-shrubs, roots and tubers etc. for food and medicinal purposes. Keeping these things in view, the management aspects should focus on enhancement of social, economic, cultural and spiritual benefits.

Similarly local people also collect and store fodder grasses for summer season. Natural regeneration is found adversely affected in those areas wherever rotational grazing system is not followed properly. Likewise, proportion of non-fodder grasses is slowly increasing in such area. Therefore, grazing in such areas needs to be managed properly to avoid adverse effect on quantity and quality of fodder species.

CHAPTER 9

ADEQUACY OF POLICY, LEGAL AND INSTITUTIONAL FRAMEWORK

9.1: EXISTING POLICY AND LEGAL FRAMEWORK AND THEIR COMPLIANCE

The existing policy and laws in the country and the State are invoked for the management of the forests of the division. The National Forest Policy of 1988 is the basic guide for the management strategy of this Plan. The Indian Forest Act 1927 and its Amendment is the Principal Law governing the administration of the forests in the division. The Plan is further guided by guidelines like:

9.1.1: National Wildlife Action Plan (2017-2031):

Ministry of Environment and Forests, Govt. of India has formulated National Wildlife Action Plan (2017-2031), based upon the decision taken in the 26th meeting of the Indian Board of Wildlife held in January 2016. The plan had outlined the strategies and action points for wildlife conservation. The strategy for action is to be adopted under wildlife action plan include among others.

- i.** Restoration of degraded habitats outside Protected Areas
- ii.** Control of Poaching, Taxidermy and Illegal Trade in Wild Animal & Plant Species
- iii.** Monitoring and Research
- iv.** Human Resource Development and Personnel Planning
- v.** Ensuring People's Participation in Wildlife Conservation
- vi.** Conservation Awareness and Education which are partly being followed in this Plan.

9.1.2: National Forestry Action Plan:

Introduction: Having about 2.5% of world's geographic area, India at present is supporting 16% of world's human population and 18% of cattle population. About 41% of forest cover of the country has already been degraded and dense forests are losing its crown density and productivity continuously. A large number of India's livestock population graze in the forests causing serious damage to soil, ground flora, including regeneration, and productivity of the forests. The use of forests beyond its carrying capacity and encroachments are the main cause of continuous degradation of forests.

To reverse the process of degradation and for sustainable development of forests, the Government of India has prepared National Forestry Action Plan (NFAP), a comprehensive strategic programme. These programmes are as follows:

- i. Protect Existing Forest Resources
- ii. Improve Forest Productivity
- iii. Reduce Total Demand of Forest Produce
- iv. Strengthen Policy and Institutional Framework
- v. Expand Forest Area

Strategies: -

- i. For sustainability and productivity of forests, the production to be increased at least 3 to 5 m³ per ha per year by promoting appropriate silvicultural treatments.
- ii. Hygiene of forests to be improved through suitable silvicultural practices.
- iii. Efforts to be made to bring one-third geographic area of the country under forest and tree cover by plantations on all categories of wastelands and agro forestry.
- iv. Plantations on non-forest wastelands to be done mostly with fuel wood species as 70% of the wood produced from forests are used as fuel wood. Species of pulpwood and other industrial wood may be encouraged in farm forestry.

9.1.3: Hon'ble Orders of Supreme Court of India:

Hon'ble Supreme Court passed an Order in Writ petition (202 of 1995) in the matter of "T.N. Godavarman Thirulmalpad" V/s Union of India. The order speaks about the felling of trees in all forests is to remain suspended except in accordance with the working plans of the State government, as approved by Central government.

Hon'ble Supreme Court passed an order on 22.09.2000 in Interlocutory Application No 424 saying that regeneration of forest should be commensurate with felling carried out under a working plan. To achieve this, it must be ensured that no felling be carried out without allocating necessary fund to regenerate the felled areas. 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.

Following the directions of Hon'ble apex court in their order dated 22.09.2000 in IA No 424; a core group was constituted to decide the extent of felling. As per these Orders, fellings are to be carried out by the State Governments only after obtaining the permission

from core group constituted by the Ministry of Environment and Forests, New Delhi, which is complied with by the Department.

9.1.4: Forest Rights Act, 2006:

After the enactment of this Act, the administration of the forest will be greatly influenced, as this act recognizes several individual as well as the community rights over the forest land and its produce. All the provisions of this Act will have to be taken into consideration while managing the forest.

The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 was passed by the Parliament of India and the assent to this Act was received from the President of India on 29th December, 2006. The said Act was notified in the Gazette of India on 2nd January, 2007. For implementation of the said Act, the Central Government notified the Rules for Recognition of Forest Rights on 1st January, 2008. These Rules were further amended by the Central Government vide notification dated 6th September, 2012.

9.1.5: Biological Diversity Act, 2002:

This Act aims to provide for Conservation of biological diversity and sustainable use of biological resources. These issues are reflected in various Working Circles and the prescriptions made there under.

India is a party to the United Nations Convention on Biological Diversity signed at Rio de Janeiro on the 5th day of June, 1992. This Convention reaffirms the sovereign rights of the States over their biological resources. Therefore, legislation was enacted by the Indian Parliament in 2002 to give effect to the United Nations Convention.

This Act aims to provide for conservation of biological diversity, sustainable use of its components and fair and equitable sharing of the benefits arising out of the use of biological resources, knowledge and for matters connected therewith or incidental thereto. The State Government has established the State Biodiversity Board and this body is looking into the various aspects of biodiversity conservation and benefit sharing, if any, arising out of the biodiversity. This act has been amended in 2023 and Biological Diversity Rules, 2024 came in force.

Biodiversity Management Committees have been formed in the District of Gondia. There is a need to establish Village Biodiversity Management Committees at least in all the Gram panchayats where JFM is being implemented.

9.1.6: GOI Orders/GOM Resolutions, Circulars etc.

Joint Forest Management approach was adopted for degraded forest area of the State vide GR dated 16 March 1992. The programme was extended to Good Forest areas vide Govt. Resolution dated 25/4/2003. The latest revision in G.R. has been made on 5th October 2011 and 10th July 2012. All JFM activities should be in consonance with the broad prescriptions of the Working Plan. The Micro plans are to be dovetailed with the prescriptions of the Working Plan.

9.2: STATUS OF APPROVED WORKING PLAN AND COMPLIANCE

Working Plan sanctioned is implemented but not fully due to various reasons like lack of funds, unavailability of area due to Eco-Sensitive Zone etc. No deviation proposal was received.

9.3: NUMBER OF FOREST OFFENCES

The numbers of forest offences that have been registered under the different categories in the last ten years are given below:

Table No. 9.1: The Extent of damage due to fire, illicit cutting & other offences

Year	Fire		Grazing		Illicit cutting				Other offences		Total		
	No. of Cases	Loss in Rs	No of Case	Loss In Rs	No. of cases	Illicit Cut tree		Loss in Rs	Amount Of Material Seized (Rs)	No of Cases	Loss In Rs	No. Of Cases	Loss in Rs.
						Teak	Non-Teak						
2013-14	172	0	0	0	2287	2105	7627	4441171	4765113	179	0	2638	4441171
2014-15	67	0	0	0	2174	2069	6686	4271988	4512966	153	0	2394	4271988
2015-16	38	0	0	0	1375	1023	4667	2375282	2308942	185	0	1598	2375282
2016-17	87	0	0	0	936	780	3662	2125857	2626765	109	0	1132	2125857
2017-18	219	0	0	0	171	453	2223	1509484	1562231	84	0	474	1509484
2018-19	241	0	0	0	968	599	2104	1521318	1465383	96	0	1305	1521318
2019-20	326	0	0	0	580	459	1639	1535116	1766307	66	0	972	1535116
2020-21	320	0	0	0	1023	892	3565	1869544	2791634	107	0	1450	1869544
2021-22	334	0	0	0	1196	852	4385	3187537	3486012	103	0	1633	3187537
2022-23	381	0	0	0	980	899	3660	3059834	2881415	38	43129	1080	2977743
Total	2185	0	0	0	11690	10131	40218	25897131	28166768	1120	43129	14676	25815040

9.4: STATUS OF RESEARCH AND DEVELOPMENT

Not much research or development work is being carried out in the Division.

9.5: HUMAN RESOURCE CAPACITY BUILDING EFFORTS

The staff of the Division is trained as per their rank-related training in the respective Forest training Schools and Rangers' Colleges etc. Apart from this regular training they are also updated with the new technology and developments in the field particularly in GIS and IT related fields. The status of special training of the staff is as follows:

Status of Trained Staff

1. Training for GIS & GPS -Surveyor 1, Forester 10 & Forest Guard 15
2. Facilities of Personal Digital Assistants are given to all guards with application like Offences cases, Fire, encroachment, grazing etc. However, the feedback received from the field is that the PDAs are being used mostly as mobile phones. There are also problems related to the lack of coverage for the use of internet for immediate sending of information as required. There is a need to further train the guards in the use of the PDAs and to ensure full use of the technology.

9.6: FOREST RESOURCE ACCOUNTING

In this Plan, all efforts have been made to place on record all the tangible benefits received from the forests. The value of the timber and firewood has been fully accounted in the last Plan and also projected for the period of this Plan (**Appendix No. XLII**). The quantity and the value of the NTFPs collected in the last ten years have been duly provided in the **Appendix No. XLIII & XLVI**.

The accounting for the intangible benefits is a task that the Division is not in a position to make, nor is it possible to be done by the WPO with limited resources. However, the Net Present Value of the forests as calculated for the calculation of NPV by the Kanchan Chopra Committee and accepted by the Hon. Supreme Court order dated 28.03.2008 is taken as the basis for the calculation of the tangible and intangible benefits for accounting the forest values in the Division. The factor of benefits that have been taken while accounting forest area is as follows.

For calculating the average Net Present Value per ha. of forest in India the following monetary value of goods and services provided by the forest have been considered.

- i) Value of timber and fuel wood
- ii) Value of Non-Timber Forest Products (NTFP)
- iii) Value of fodder
- iv) Value of Eco-tourism
- v) Value of bio-prospecting
- vi) Value of Ecological services of forest
- vii) Value of Flagship Species
- viii) Carbon Sequestration Value.

For the purpose of the valuation of the forest, the following Eco-classes of forests have been identified for the purpose of calculation and 16 major groups of forest types of India as classified by the Champion & Seth have been reduced into the following Eco-classes, namely:

Eco-class I - Consisting of Tropical Wet Evergreen Forests, Tropical Semi Evergreen Forests and Tropical Moist Deciduous Forests

Eco-class II - Consisting of Littoral and Swamp Forests

Eco-class III- Consisting of Tropical Dry Deciduous Forests

Eco-class IV - Consisting of Tropical Thorn Forests and Tropical Dry Evergreen Forests

Eco-class V - Consisting of Sub-tropical Broad Leaved Hill Forests, Sub-Tropical Pine Forests and Sub Tropical Dry Evergreen Forests

Eco-class VI - Consisting of Montane Wet Temperate Forests, Himalayan Moist Temperate Forests, Himalayan Dry Temperate Forests, Sub Alpine Forest, Moist Alpine Scrub and Dry Alpine Scrub.

The forests of Gondia come under the Eco Class III and the value attached to this Class area as given below as per the canopy density. The average value of the forests stands at Rs. 238.73 billion and varies with the type of forest and its attributes. This value has further been revised by the India Institute of Forest Management, Bhopal and is yet to be approved. The IIFM study is more comprehensive and takes into account all aspects of the intangible benefits that the forest eco-system provides.

Below is given the value of the forests of Gondia as per the current and proposed NPV value which takes into account the tangible and some components of the intangible benefits.

Table 9.2 Calculation of Forest worth based on NPV

SR. No.	Area of Gondia district under different canopy density		Current rate of NPV (Rs Lakh/ha)	Value of Forests as per current rate (Rs) in Billions
	Category	Area (ha.)		
1	VDF	96258	13.57	130.62
2	MDF	66220	12.29	81.38
3	OF	27903	9.58	26.73
Total		190381		238.73

The value of the forests of Gondia comes to Rs. 238.73 billion as per the current rate.

Thus, the value of the Forest when computed holistically taking into account its myriad tangible and intangible benefits that it provides, is far more than what can be gained through the traditionally viewed benefits of timber and other forest produce. Forest resource accounting will be more comprehensive, if we are in a position to decide all intangible benefits at the local level which may be taken up as one of the projects in due course of time.

9.7: BUDGETARY ALLOCATIONS TO THE FORESTRY SECTOR

Statement showing Revenue, Expenditure and Surplus in Gondia Forest Division is given **Appendix no. XLIV** and the statement showing non-plan grant / expenditure for Gondia Forest Division is given in **Appendix no.XLIX**.

9.8: EXISTENCE OF MONITORING, ASSESSMENT AND REPORTING

MECHANISM

Monitoring & assessment is done at Range Forest Officer, ACF & Dycf. levels, CCF (T) & CF (WP) as per GR No. Sankirna-2011/F.No.289/F-7, dt.29/09/2011 also required to ensure proper implementation of WP.

9.9: PUBLIC AWARENESS AND EDUCATION

Public awareness is carried out by the Division and the Social Forestry Wing of the Department in the District. In schools having Eco-clubs regular around the year programs are held and all-important days related to the Environment and Forests are celebrated enthusiastically. Regular field visits, projects etc are also taken up. Seed Banks are established in each of the schools.

The Division also celebrates Van Mahotsav and Wildlife Week on a regular basis and various programs like Essay/Drawing/ Extempore Speech Competitions are held at all levels up to the State level.

9.10: ADEQUATE MANPOWER IN FOREST DIVISION.

9.10.1: Staff

Gondia forest division is coterminous with the district boundary and is headquartered at Gondia. It is headed by an officer in the rank of the Deputy Conservator of Forests. The statement showing the names of Dy. Conservator of Forests, Gondia Division has been shown in **Appendix No. II**.

Further reorganization of the Forest Department was done in 1981-82 with a view to remove unwieldiness of administrative charges by making them compact and manageable units for efficient administration. Government of Maharashtra vide its G R No FDN-1081/76/03-F-2, dated 11.6.1981 sanctioned reorganization of ranges, round and beats with effect from 1.9.1981. The new posts of accountants were created vide G R No FDM-1879/17-F-2 dated 11.6.81 and each range was provided with an accountant to cope with the increased quantum of work and to increase the efficiency in the range offices. One post of Junior Statistical Assistant was created in each Division vide Government Resolution No. FDM-1081/76710-F-2 dated 12.5.1981, to have timely and accurate statistical data needed for the formulation and implementation of forestry development programmes and diversifying the forest management.

Gondia Division has sanctioned strength of 669 posts in total, ranging from the Deputy Conservator of Forests to the Van Major. The details of the staff and the manpower, in the Division, as on date, are given in the table below:

Table No. 9.3: Present staff position in the Gondia Division Year 2022-23

Sr. No	Designation	Sanctioned	Filled up	Vacant post
1	Dy. Conservator of Forest	01	01	00
2	Asst. Conservator of Forest	03	03	00
3	Range Forest Officer	16	14	02
4	Office Superintendent	01	01	00
5	Chief Accountant	01	01	00
6	Accountant	14	14	00
7	Surveyor	02	02	00
8	Clerk	22	21	01
9	Forester	71	66	05
10	Forest Guard	314	308	06
11	Police Constable	01	00	01
12	Jeep Driver	09	09	00
13	Tractor Driver			
14	Naik	01	0	01
15	Peon	06	06	00
16	Watchman	10	10	01
17	Waterman	01	01	00
18	Sweeper	01	01	00
19	Tractor Cleaner	03	02	01
20	Forest Labour	183	183	00
	Total	669	633	36

9.10.2: Labour Supply

The erstwhile forest villages, which were established with the object of supplying adequate and assured labour for the various forestry operations have since been declared as revenue villages vide Govt. Notification No FLD 4207/ 1- Y dated 23.05.1967 and 3675/87519- F-6 dated 24.6.1977. Administration of these villages, at present, lies with the Revenue Department. However, laborers from these villages are continued to be engaged for various forestry works in the Division.

The labour supply in general is inadequate. Large number of Van Majoor have been regularized in the recent past. They should be judiciously used for executing various forestry works including general protection of forests.

CHAPTER 10

FIVE YEAR PLANS

Since 1947, the Indian economy has been premised on the concept of planning. This has been carried through the Five-Year Plans, developed, executed, and monitored by the Planning Commission (NITI Aayog after 2014). With the Prime Minister as the ex-officio Chairman, the commission has a nominated Deputy Chairman, who holds the rank of a cabinet minister. Montek Singh Ahluwalia is the last Deputy Chairman of the Commission (resigned on 26 May 2014). The Eleventh Plan completed its term in March 2012 and the Twelfth Plan is currently underway (1) Prior to the Fourth Plan, the allocation of state resources was based on schematic patterns rather than a transparent and objective mechanism, which led to the adoption of the Gadgil formula in 1969. Revised versions of the formula have been used since then to determine the allocation of central assistance for state plans. (2) The new government led by Hon. P.M. Shri. Narendra Modi, elected in 2014, has announced the dissolution of the Planning Commission, and its replacement by a think tank called and NITI Aayog (an acronym for National Institution for Transforming India).

1	History	Range-wise Plan	1893 – 1910
		Best's Working Plan	1910 – 1930
		Chadha's Working Plan	1930 – 1940
		Jagdamba Prasad's Working Plan	1940 – 1957
2	First Plan (1951-1956)	Jagdamba Prasad's Working Plan	1940 – 1957
3	Second Plan (1956-1961)	Trivedi's Working Plan	1957 – 1977
4	Third Plan (1961-1966)	Trivedi's Working Plan	1957 – 1977
5	Plan Holiday (1966-1969)		
6	Fourth Plan (1969-1974)	Trivedi's Working Plan	1957 – 1977
7	Fifth Plan (1974-1979)	Trivedi's Working Plan	1957 – 1977
		Patil & Sardar's Working Plan	1977 - 1996
8	Rolling Plan (1978-1980)	Patil & Sardar's Working Plan	1977 - 1996
9	Sixth Plan (1980-1985)	Patil & Sardar's Working Plan	1977 - 1996
10	Seventh Plan (1985-1990)	Patil & Sardar's Working Plan	1977 - 1996
11	Annual Plans (1990-1992)	Patil & Sardar's Working Plan	1977 - 1996
12	Eighth Plan (1992-1997)	Patil & Sardar's Working Plan	1977 - 1996
		Shri. Jarnal Singh, Sardar & Joshi Working Plan	1981-82 to 1995-96
13	Ninth Plan (1997-2002)	Shri. Jarnal Singh, Sardar & Joshi Working Plan	1981-82 to 1995-96
14	Tenth Plan (2002-2007)	Shri. Vinay Kumar Shinha, Arakkal Asharaf & Shri. Jarnal Singh Working Plan	1996-97 to 2005-06
		Shri. Vinay Kumar Shinha, Arakkal Asharaf & Shri. Jarnal Singh Working Plan	2009-10 to 2018-19

15	Eleventh Plan (2007-2012)	Shri. Vinay Kumar Shinha, Arakkal Asharaf & Shri. Jarnal Singh Working Plan	2009-10 to 2018-19
16	Twelfth Plan (2012-2017)	Shri. T.K.Choubey Working Plan	2013-14 to 2022-23
17	Three-Year Action Agenda (for 2017-2020)	Shri. T.K.Choubey Working Plan	2013-14 to 2022-23
18	Strategy for New India @ 75 (2017-2022)	Shri. T.K.Choubey Working Plan	2013-14 to 2022-23

10.1 As per the Twelfth Plan Document under Environment, Forestry and Wildlife 209 the following is the monitorable Target for Twelfth Plan.

Environment and Climate Change

1. Assess and remediate 12 identified contaminated sites (hazardous chemicals and wastes) with potential for ground water contamination by 2017.
2. Clean 80 per cent of critically polluted stretches in rivers by 2017 and 100 per cent by 2020.
3. States to meet NAAQS in urban areas by 2017.
4. To reduce emission intensity of our GDP in line with the target of 20 to 25 percent reduction over 2005 levels by 2020.

Forests and Livelihood

1. Greening 5 million ha under Green India Mission including 1.5 million ha of degraded lands, afforestation and eco-restoration of 0.9 million ha of ecologically sensitive areas.
2. Technology-based monitoring of forest cover, biodiversity and growing stock including change-monitoring on periodical basis through dedicated satellite by 2017 and establishment of open web-based National Forestry and Environmental Information system for research and public accessibility by 2015.
3. Engagement of Village Green Guards/Community Foresters for every Joint Forest Management (JFM) village by 2016.
4. Establish forestry seed bank in forest circles and Model Nursery in every district with information on public portal by 2014.

Wildlife, Ecotourism and Animal Welfare

1. Twenty per cent of veterinary professionals in the country will be trained in treating wildlife.
2. Integrated Ecotourism District Plans covering 10 per cent of all potential Protected Areas (PAs) by 2017.

3. Promoting participation of private sector, civil societies, NGOs and philanthropists in animal welfare.

Ecosystem and Biodiversity

1. Restore 0.1 million ha of wetlands/inland lakes/water bodies by 2017.
2. Mapping and preparation of biodiversity management plans for deserts (both cold and arid), coastal areas, important coral zones, wetlands, mangroves and so on to be completed by 2017.

10.2 As per the Twelfth Plan Document of the Planning Commission under Environment, Forestry and Wildlife, the following are the Goals.

Environment

1. Epidemiological studies to assess improvement in health status due to better management of Environment and ecology.
2. Promotion and adoption of cleaner technology, strengthening and initiation of reforms in regulations, policy making and enforcement institutions for environmental governance.
3. Move towards cumulative and strategic EIA.
4. Ensure ecological flows in all rivers by regulating abstractions so as to allow conservation of riverine ecosystems through developing a legal framework and management strategy for conservation of river basins.
5. Promotion of recycling and reuse of treated sewage in urban projects such as sanitation, Landscaping, central air conditioning and so on.

Forests and Livelihood

1. Improve forest productivity, production and sustainable management of biodiversity (equity in access to benefit sharing with local people).
2. Restoration and intensification of forest-rangelands/grazing-land management and establish community grazing land around forest fringe villages.
3. Build capacity of Village Forest Committees/Joint Forestry Management Committees for management of forest resources including ecotourism.
4. Revive seed orchards and silviculture plots for various forest types of the country, as well as, for enlisted species under Minor Forest Produce/Non-Timber Forest Produce (MFP/NTFP) including genetic improvement of and establishment of clonal orchards.

Wildlife, Ecotourism and Animal Welfare

1. Reducing and managing human–wildlife conflict.
2. Commercialization of permissible marine products rich in poly unsaturated fatty acids (PUFAs), vitamins and so on.
3. Promotion of ecotourism and participatory eco-development support livelihood of local population.

Ecosystem and Biodiversity

1. Develop national targets and indicators related to biodiversity and support actions to strengthen implementation of Biological Diversity Act, 2002 and ensure bio-safety for economic and social development of local communities.
2. Assess coastal biodiversity resources, ensure sustainable management, restoration of mangroves, coral reefs and wetlands and support livelihood.

CHAPTER 11

PAST SYSTEMS OF MANAGEMENT

11.1 GENERAL HISTORY OF THE FOREST

11.1.1 The earlier Gondia (including the newly created Gondia district) district was formed in 1821 by combining areas of Nagpur Territory and Part Wainganga. Marathas ruled Gondia up to 1853. Consequent to the death of Raghuji III in 1853, the district became British territory by the Doctrine of Lapse. Short-term settlements of land revenue were carried out during the Maratha rule by the appointment of an official called Mamlatdar who collected the land revenue. During the British rule Zamindari rights were conferred on the persons who had held possession of land for a long time and who were capable of paying revenue to the Govt. Removal of forest produce from the land constituted a major portion of the revenue. Consequent to the enactment of the Indian Forest Act in 1878, large areas of forests in the possession of the Zamindars were declared as Reserved Forests, while the remaining forests remained with the Zamindars till the abolition of the Proprietary Rights by way of the M.P. Abolition of Proprietary Rights (Estates, Mahals and Alienated Lands) Act of 1950.

As a result, all the private forests were vested with the State Govt. with effect from 1st April 1951. Good forest patches thus taken over by the Revenue department were subsequently transferred to the forest department for management. These forests were declared as Protected Forests under Section 29 of the Indian Forest Act 1927. Subsequently some of these Protected Forests were declared as Reserved Forests under Section 20 of I.F.A. 1927.

11.1.2 While the Reserved forests are managed under the working plans since 1897, the exproprietary Forests were brought under scientific management at a much later stage.

11.1.3 Management history of the Reserved Forests can be studied under three periods: (a) pre-reservation period from 1853 to 1878, (b) early reservation period from 1879 to 1893, and (c) regular forest management using the working plans since 1893.

11.2 PAST SYSTEM OF MANAGEMENT AND THEIR RESULTS

11.2.1 Forest Blocks before Forest Reservation: 1853-1878

There was no organized management of the forests. The forests were open to indiscriminate felling and grazing by any one paying the prescribed fee. The Zamindars rights were given to the persons holding possession of the lands. They used to earn considerable

revenue from the removal of forest produce. The areas adjoining the villages were excessively harvested and grazed upon. The aborigines also practiced shifting cultivation. Seeing the destruction caused to the forests it was decided to bring about some control in the exploitation of the forests and to introduce scientific forest management. Hence, the Forest Department was created in 1862 with the specific purpose of surveying and demarcating the forests and also the preparation of map.

11.2.2 Forest Blocks Soon After Reservation: 1879 To 1893

After the enactment of the Indian Forest Act 1878, the good forests in the possession of Zamindars were declared as Reserved Forests in 1879 as a the first step towards proper management of the forest resources. Trees like Teak, Bija, Shisham, Kusum, Haldu and Kullu were reserved and could not be removed without a license. The felling of fruit trees was also banned. The felling of fruit trees of Mahua, Harra and char was also prohibited. Thus, there was no scheme to regulate the felling because of which purchasers could fulfill their requirements from anywhere they liked, which resulted in over harvesting of accessible areas as the purchasers could obtain their requirements from anywhere, they liked. This resulted in over harvesting in accessible areas, while the inaccessible areas were left untouched.

11.2.3 Forest Blocks under the Working Plan Since 1897

The working plan for the Reserved Forests of the old Pratapgarh Range (1897–1910) was the first working plan for the Gondia Division. Later, working plans were prepared for the entire Gondia Division, which also included the Gondia Forests. The authors of the successive four working plans are J. W. West (for 1910–1930), Chadha (for 1930–1940), Jagdamba Prasad (for 1940–1957) and Trivedi (for 1957–1977). The last working plan prepared by M.G.Sardar, P.J. Gurjar and S.G.Joshi for the period of 1981-82 to 1995-96 covered the entire Reserved Forests including all the Forest Blocks of the Gondia Division and area reserved in 1977-1978.

11.2.4 Working Plan for the Pratapgarh Range 1897–1910.:

This working plan covered all the Forest Reserves in the present Gondia Division. The well-stocked areas were worked under the Improvement Working Circle with thirty-year felling cycle. Fixed number of standards was reserved from felling. The best stems were removed till 1903, and thereafter all tress except the reserved tress were extracted resembling the Coppice-with-standard system. Annual coupes were closed to grazing for ten years. Prescribed seed sowing was not implemented. Removal of bamboo and dry wood was permitted in the remote and inaccessible areas of the Unworkable Working Circle, and the

inferior forests of the Grazing Working Circle. Bamboo was extracted on three-year cycle, and grazing was permitted.

11.2.5 The Best's Working Plan 1910–1930:

The Best's Plan had High Forest and Coppice-With Standard working circles, and the Bamboo (Overlapping) Working Circle.

11.2.5.1: The High Forest Working Circle with fifteen-year felling cycle had areas capable of growing large-sized trees of valuable timber. The entire old Pratapgarh Range constituted on felling series. The improvement felling combined with removal of the mature and over mature trees was prescribed minimum exploitable girth for Teak, Saja, Bija, Tendu, Semal, Arjun, Moha and Kusum was 180 cm GBH. The exploitable GBH for Lendia, Dhaora, Salai, Shivan, Jamun, Haldu and Bhirra was 150 cm, while other species were extracted at 135 cm GBH. Many mixed poor forests were included in this Working Circle to obtain easy boundaries, and forests containing valuable trees worked heavily during the earlier plan were excluded without proper justification. The light working resulted in congestion of the crop and reduction in the natural regeneration.

11.2.5.2: Coppice-With-Standards Working Circle had thirty-year felling cycle. Only sound 75 sound first-class trees and well-grown Harra capable of producing large sized timber were to be reserved in a hectare. In hills, all sound first class trees were to be reserved, and the number of standards was to be increased in better quality forests. In the absence of trees of first class, trees of second class were to be reserved. Bija, Shisam, Tinsa, Saja, Surya, Moha, Bhirra and Dhaman were the first class species, while Arjun, Garari, Lendia, Dhaora, Tendu, Rohan, Khair, Hiwar, Amaltas, Siwan, Haldu, Kusum, Parad, Mundhar and Hirda were the second class species. The remaining tree species were identified as the third class. The working generally benefited the growing stock, and the resultant crop was straight, sound and well formed.

Light thinning was started after the Farington's tour to then Gondia Division in 1922, and was carried out on a small scale. The thinning benefited the crop.

11.2.5.3: Bamboo (Overlapping) Working Circle prescribed three-year cycle. Bamboo was not to be felled above 90 cm. The instructions included retention of all current year bamboo culms and half of the green culms in a clump.

11.2.6 The Chadha's Working Plan: 1930–1940

The entire forest area was stock mapped at four-inch-to-a-mile scale, and forests were divided into compartments. The High Forest, the Simple Coppice and the Miscellaneous Working Circles were formed on the basis of the stock maps. Similarly, the Bamboo (OL) Working Circle was also defined.

11.2.6.1 High forest working circle: Compact forests containing good percentage of Teak, Bija, Saja or Surya and capable of producing large-sized timber as well as the remote hilly areas with little demand for forest produce constituted the High Forest Working Circle. The felling cycle for the two series in the old Pratapgarh Range was fixed as twenty years. The operations included (a) the rab burning in the year of main felling, (b) cutback of suppressed, damaged and malformed advanced growth, (c) opening of canopy in areas having established regeneration, (d) removal of unsound, crooked and malformed trees, (e) thinning in the congested crops, (f) removal of mature trees above 120-cm GBH and (g) clear felling of poor-quality mixed forests. Generally, the entire annual coupes could not be worked, and only selected patches of Teak and other valuable species were harvested. Unworked forests in the remaining areas of the coupes resulted in congestion and deterioration of the crop.

11.2.6.2 Simple Coppice Working Circle: All the remaining mixed forests were worked under the simple coppice system with thirty-year rotation in quality IV (a) crop and forty-year rotation in the IV (b) forests. The main object of management was to produce poles of 30 cm to 60 cm girth. The prescriptions included clear felling in well-stocked areas of the main coupes and thinning at half the rotation age. All Moha and Khirni trees as well as ten Arjun trees along the streams were protected from felling and the list was enlarged in 1932 to include Semal trees up to 105-cm GBH. The system was later on modified to the Coppice-with-Reserve System, and all trees up to 30 cm GBH were kept as reserves. Rohan and Parad trees proved to be beneficial in the eroded and calcareous areas. Garari started dominating in the clear felled areas compromising the growth of valuable species like Bija and Saja. Subsequent thinning helped in producing healthy and well-grown poles.

11.2.6.3 Miscellaneous Working Circle: The Miscellaneous Working Circle included unworkable areas, forest villages, mining leases, irrigation project areas and areas under the lac cultivation. Lac was to be extracted departmentally.

11.2.6.4 Bamboo (Overlapping) Working Circle: The prescriptions in the bamboo areas included retention of all current-year bamboo culms and at least eight culms of over one year in age in each clump. All dead bamboos were to be removed. The height of cutting was not to exceed 45 cm.

11.2.7 The Prasad's Working Plan: 1940–1957

The stock maps of areas under the High Forest Working Circle were revised. Newly constituted Reserved Forests in the Palastola, Dewangota and Rajoli blocks were stock mapped and divided into the compartments. The plan set up five area-specific (High Forest, Improvement, Coppice-with-Reserve, Miscellaneous and Plantation) and two overlapping (Bamboo and Semal) working circles.

11.2.7.1 High Forest Working Circle: Forests of the High Forest Working Circle in earlier plans were retained this Working Circle. The Conversion-to-Uniform System with four periodic blocks was applied in the area, and the conversion period was fixed at eighty years. Teak followed by Shisam, Tinsa, Bija and Semal were the main species to be favoured. The prescriptions for the PB I areas included clear felling in areas having sufficient established regeneration of seedling or coppice origin after retaining promising teak saplings and poles up to 50 cm GBH. After removing all teak trees above 90 cm, improvement felling was to be carried out in the crop. Felling in the under stocked or blanks areas was restricted. Harvesting of poor quality mixed forests under the Coppice-with-Reserve system was permitted to meet the demand. Teak plantations after clear felling of the mixed forests were recommended. Cleaning and thinning were laid down in fifth and eleventh year, respectively. Removal of all teak trees above 90 cm resulted in significant loss of seed bearers, shrinkage of the teak areas and forests becoming poorer in teak. Natural regeneration of teak was generally unsuccessful. Since bamboo clearance was not prescribed, bamboo growth hampered natural regeneration. Suppressed and useless teak trees were also retained at many places. Natural as well as artificial regeneration was not properly addressed. The CWR working was to be done in poor forests, but was applied in some good quality forests defeating the objectives of the High Forest Working Circle. Even the reliance on coppice regeneration was contradictory to the objects of the High Forest System. Some areas were not suitable for this system.

Crown thinning favoring trees in 112.5–150.00 cm GBH was directed in the PB II area. For the un-allotted PBs III and IV, thinning in favor of trees having 50–112.50 cm GBH was prescribed in ongested stands forty years in advance of main felling. Dead, diseased and over-mature trees (above 150 cm GBH) were to be removed. Most areas of the PB II were on precipitous and very steep slopes, and were unfit for any kind of working. Some areas of PB III and IV were suitable for allotment to the PB I, and wantonly felling of over mature trees without silvicultural considerations caused extensive damage. Cleaning and thinning were generally not carried out causing congestion and suppression in the crop.

11.2.7.2 Improvement Working Circle: Areas of the High Forest Working Circle in the previous plans considered unsuitable for the working circle were included in the Improvement Working Circle. Silvicultural felling was prescribed on forty-year cycle with exploitable girth at 150 cm GBH for teak, Saja, Bija and Mundhar and 90 cm GBH for Lendia, Surya, Tinsa and Dhaora. The species to be favored were Teak, Shisham, Tinsa, Bija and Semal. The main prescriptions were removal of all (a) dead and diseased trees, (b) silviculturally available trees above exploitable girth, (c) wolf trees and (d) overhead cover over the straight and healthy poles (up to 62.50 cm GBH) of valuable species such as Teak, Bija, Tinsa and Shisham. Thinning was prescribed in the group of teak poles. Since the crop was mostly mature and all the mature trees were removed. Further, trees below the selection girth were also felled without assigning reasons for the removal. Thus, the CWR working was applied over this area.

11.2.7.3 Coppice-with-Reserve Working Circle: The CWR system with forty-year cycle was prescribed to meet demands for poles and small timber. Felling was prohibited in the under stocked, the climber-infested and the lac-bearing areas as well as on the steep slope and along the large streams. Felling of Moha trees near inhabited villages, Semal and Kullu trees was also prohibited. The CWR working prescribed minimum of seventy-five standards per hectare. All seedlings and saplings up to 22.50 cm GBH and Bija trees up to 90 cm GBH were reserved. On sites having sufficient regeneration of seed or coppice origin, reserved trees included isolated Teak trees of any shape and sound, straight and well-grown poles of Teak, Shisham, Saja, Tinsa, Haldu and Siwan having 60 cm GBH. In case of insufficient regeneration, most of the species, other than Lendia, Dhoban, Gongal, Mokha, Baranga and Mowai were to be kept as reserve irrespective of their sizes. Number of reserved trees was also to be kept much higher. Thinning was prescribed in the eleventh year. Crown thinning was prescribed after twenty years of main felling. The thinning rules included felling of all Garari poles above 40 cm GBH and dense clumps of bamboo. Soon after introduction of the plan, the prescriptions were modified to include removal of dead, dying and over matured trees in the under-stocked, erosion-prone and climber-infested forests. Similar removal was also prescribed in the High-quality Saja-dominated mixed forests, areas having good quality grass and large proportion of financially immature trees. Tendu, chinch, Mango and Hirda were added in the list of reserved species. Garari was excluded from the reservation. Bija, Dhaora and Bhirra were added in the list of reserved species in areas having sufficient regeneration. Larger GBH trees were to be preferred as reserves.

The number of trees to be reserved became satisfactory after the modification. The prescriptions generally worked well, but they did not provide concentrated working in Teak patches. In spite of the restrictions, good quality non-teak forests were felled heavily at many places. The eleventh-year thinning was not carried out leading to suppression in teak in many areas, but the crown thinning after the twentieth year was carried out fairly regularly. Garari poles over 40 cm GBH were to be removed to get another pole crop of similar size during the second half of the rotation. This expectation proved to be erroneous, and the growth was slower.

11.2.7.4 Miscellaneous Working Circle: The areas of forest villages, mining leases, irrigation projects and lac areas as well as unworkable compartments (224, 225B, 226B, 245B, 251 and 252) were included in the Miscellaneous Working Circle.

11.2.7.5 Bamboo (Overlapping) Working Circle: The Bamboo (Overlapping) Working Circle covered the bamboo-bearing areas. The harvesting was prescribed with four-year cutting cycle. All current-year culms and a minimum of eight culms were to be retained in each clump. The height of the cutting was to be kept at or below 45 cm from the ground. All dead culms were prescribed for removal. In practice, the procedure of extraction on rated passes made it difficult to enforce cutting prescriptions, and resulted in overexploitation of the clumps near villages and unworked clumps in the remote areas.

11.2.7.6 Semal (Overlapping) Working Circle: Harvesting of Semal trees above 120 cm GBH was proposed in the Semal (Overlapping) Working Circle with twenty-year felling cycle. The extraction was done in the period 1939-40 to 1954-55.

11.2.7.1 Plantation Working Circle: Teak plantations on suitable sites were prescribed in the mixed forests. The plantations were raised during 1940-41 to 1955-56, but were unsuccessful due to poor site selection and improper care.

Advance Working: Advance working in coupe XIII of the High Forest and the Improvement Working Circles as well as in coupe XXIII of the CWR Working Circle was carried out during 1951-52 in order to obtain more revenue.

11.2.8 The Trivedi's Working Plan: 1957-1977 (Extended Till 1979-80)

After correcting the stock maps, wherever required, the four area-specific (Selection-Cum-Improvement, CWR, Pasture and Miscellaneous) and two ((Bamboo and Lac) overlapping working circles were prescribed.

11.2.8.1 Selection-Cum-Improvement Working Circle:

The Selection-cum-Improvement Working Circle had twenty-year felling cycle. The preferred species were teak, Shisham, Bija, Saja, Semal, Tinsa, Dhaora, Bhirra, Surya, Lendia, Salai and Garari. The better-quality forests had higher harvestable girth than the inferior quality forests. Harvestable girth for teak, Bija, Saja and Haldu was 135 cm and 120 cm GBH. Harvestable girth (GBH) was 120 cm and 95 cm for Shisham and 90 cm for Bhirra and Salai. Garari had 60 cm and 45 cm GBH for the harvestable girth. All trees of Semal, Kulu and Hirda and sound trees of fruit-yielding species like Moha, Tendu, Khirni, Achar and Bhilawa were reserved against felling. Removal of only dead and dying trees were permitted in the type-I areas, which included precipitous and steep slopes, under stocked areas of density up to 0.4, erosion-prone areas and twenty-meter buffer along rivers and streams. Extraction was limited to only half of trees above harvestable girth in the remaining type-II areas. Crown thinning was prescribed in the even-aged crop, and dense patches having profuse teak regeneration were to be clear felled. Suppressed and malformed advance growth was to be cut back. Singling of coppice shoots and coppicing malformed saplings of valuable species were laid down. The cutback operations in the following year, cleaning in the sixth year and thinning in the eleventh year were also prescribed.

The prescriptions of retention were seldom followed, and some areas had insignificant proportion of mature trees. The resultant crop was depleted in density and proportion of mature trees. Cleaning and thinning was generally not applied, and malformed advance growth of teak also was not cutback. Although necessary, cleaning and thinning in the mixed crop was not prescribed at all. Recurrent annual fire badly damaged the natural regeneration.

11.2.8.2 Coppice-with-Reserve Working Circle: IVa forests mixed with patches of III and IVb were worked under the Coppice-with-Reserve Working Circle with fifty-year rotation. The preferred species were Teak, Bija, Tinsa, Shisham, Saja, Semal, Siwan, Salai and Siras in this order. Removal of only dead and dying trees were permitted in the type-I areas defined similar to the Selection-cum-Improvement Working Circle. The Divisional Forest Officer had discretion to mark and fell silviculturally available over-mature trees in the stream buffer. All Kullu, Hirda, fruit bearing species like Moha, Achar, Tendu, Mango, Imlı and Khirni and sound trees of Semal, Kusum, Palas, Ghont and Ber were reserved from felling. Half of the trees above harvestable girth in quality III forests in the type II areas were to be felled. Crown thinning and opening up of advanced growth of teak was prescribed in manner similar to the Selection-cum-Improvement Working Circle. The harvestable girth (GBH) was fixed at 45

cm for Garari, 90 cm for Bhirra and Salai, 105 cm for Shisham and 120 cm for teak, Bija, Saja and Haldu. Thinning was prescribed in the congested crop. Moderately stocked and well-stocked areas on the quality III sites were identified as the type III areas. Miscellaneous species and bamboo interfering the growth of valuable species were to be removed. Some poles of Teak, Bija, Semal, Saja, Bhirra and Dhaora were to be retained for providing shade and protection to young growth.

In patches of inadequate regeneration and medium to low stocking, 100 to 125 reserve trees (standards) per hectare were prescribed. Sound trees of Bija and Haldu up to 90 cm GBH, Shisham and Salai up to 60 cm GBH and other species (except Garari) up to 30 cm GBH were to be retained. In patches of well stocked forests having adequate regeneration, all sound trees of Bija and Haldu up to 90 cm GBH, Shisham and Haldu up to 60 cm GBH were to be reserved. Sound and well-grown trees of Teak, Saja, Tinsa, Siwan and Bhirra up to 90 cm GBH in Iva and IVb areas and Teak and Saja trees up to 150 cm in the quality III areas were to be reserved. Not less than 75 trees per hectare of seedling origin were to be reserved. Reserves included all well grown advance growth (except Garari) up to 22.5 cm GBH.

As the prescriptions were cumbersome, the staff could not follow and properly implement the prescriptions. Consequently, all trees, except 50–75 standards per hectare, were removed. Further, standards also included inferior species and advance growth resulting in depletion of the valuable species like Bija, Saja, etc. Species like Saja, Bija, Rohan, Dhaora, Bhirra and Haldu did not coppice well, and annual fires adversely affected establishment of the regeneration. Thus, the forests became poorer in valuable species and the extent of under stocked areas increased. The cutback operations, cleaning and thinning were not prescribed for non-teak species, and operations were not scrupulously followed in the teak areas. The subsequent crop had suppression among valuable species and malformation in the advance growth.

11.2.8.3 Pasture Working Circle: Most areas covered in the Pasture Working Circle had become under stocked due to heavy grazing, fire and regeneration failure. Each grazing had two sections, which were to be closed to grazing alternatively during the monsoon period from 1st July to 21st October. The Conservator of Forests had authority to sanction harvesting of mature trees in the well-stocked areas. Planting of fodder grass as well as fodder and shade trees were prescribed. In the areas, no efforts were taken to introduce superior grasses and to plant fodder trees. The exception was compartment 301, which had the 1970 plantations of fodder grasses such as Paonia, Sheda, Marvel, Mushan, etc. The monsoon closure was not effective, and the areas deteriorated.

11.2.8.4 Miscellaneous Working Circle: The areas under grassland (grass birs), forest villages, irrigation projects and mining leases were included in this Miscellaneous Working Circle. Prescriptions were limited to the grass birs, where eradication of weeds and climbers, opening up the dense patches and planting fodder species such as Anjan, Mowai and Pipal were prescribed. The directives included burning of grass birs in the last week of May once in five years, and the burning was to be followed by light soil working and seed sowing of Paonia, Sheda, Mushan, Marvel and Sanibabajara.

11.2.8.5 Bamboo (Overlapping) Working Circle: - All the bamboo areas were included in the Bamboo (overlapping) Working Circle. The bamboo cutting had four-year felling cycle, which was later modified by the Chief Conservator of Forests in September 1966 to three-year cycle. Hygienic operations included removal of all dead and broken bamboo. The cutting system prohibited removal of all current-year and previous-year culms as well as mature culms double in number to the current year culms. Clumps having less than ten culms were considered unfit for the bamboo extraction. Working season was limited to October to June. Gregariously flowered areas were to be strictly protected from fire and grazing till the clump formation. Except in the bamboo area allotted to the Ballarpur Industries, bamboo was harvested on the rated passes. The felling directives were not properly followed in such areas, and the cutting was confined to easy access areas, while the remote areas remained unworked. Illicit cutting of bamboo in the areas near the villages were heavy even during the rainy season. Heavy fires generally destroyed green bamboo on the clump periphery. Depletion of bamboo clumps is evident in most of the areas.

11.2.8.6 Lac (Overlapping) Working Circle: The lac-bearing areas constituted the Lac (Overlapping) Working Circle. Palas, Ghont, Ber and Kusum trees were the main lac hosts. The lac cultivation from 1951 to 1954 was found uneconomical. Fire used to damage the crop. Lessees of the lac areas did not cultivate lac in the forests, and lac was mostly collected from Palas trees in private lands, ex-proprietary forests and road strips.

11.2.9 The Sardar, Gurjar and Joshi's Working Plan for The Reserved Forests Including Forest Blocks: 1981–1996

The Sardar, Gurjar and Joshi's plan covered all the old Forest Blocks as well as the Reserved Forest areas constituted in 1977-78 from the acquired ex-proprietary forests. The stock maps of the Forest Blocks were verified and corrected. The areas of the newly Reserved Forests were stock mapped on 1:15,000 or 1:15,840 scale using toposheet of the Survey of India. Some areas were stock mapped using base maps at 1:15,000 or 1:15840 scales reduced

from the village maps drafted by the Forest Settlement Officer. The Conversion, Coppice with Reserve, Improvement, Pasture, Protection and Miscellaneous Working Circles were six area-specific working circles, while the Bamboo and the Wildlife Management were two overlapping working circles prescribed in the plan. Felling on steep slopes and in the buffer along streams and roads was limited to removal of dead, dying and malformed trees.

11.2.9.1 Conversion Working Circle: Good quality Teak and the mixed forests of quality Iva and above were included in the Conversion Working Circle, which prescribed clear felling followed by the teak planting. The eroded and the poor areas were to be planted with Khair and Sissoo. The conversion period was sixty years and each felling series has three twenty-year periodic blocks. Soil and moisture conservation was to be carried out immediately after the main felling. In areas having profuse regeneration, cutback of the advance growth of Teak and other valuable species was prescribed. Bamboo clumps was to be cut in the first and the second year in order to support natural regeneration of Teak and other valuable species. The rab burning and planting at two-meter interval was prescribed. The sixth-year cleaning included clear felling of bamboo, singling of coppice shoots and removal of the inferior species suppressing Teak seedlings. The first and the second mechanical thinning were to be done in ninth and fifteenth year of the Teak plantations. Silvicultural thinning was to be carried out in naturally regenerated areas. The young to middle-aged crops in the PB II areas were to be spaced out to about one-third of the average height by thinning. In addition to tending of coppice shoots, thinning in plantations and improvement felling in natural forests were prescribed in the PB III areas.

Although cutting followed by burning of bamboo clumps was provided in the plan, bamboo planting accompanied the Teak plantations. Bamboo suppressed Teak, and most plantations did not put on the expected growth. Uncontrolled grazing and recurrent fires damaged teak plantations and naturally regenerated areas. Thinning was not carried out properly, and the crop became congested and stunted. In the clear-felled areas, the fast-coppicing species like Garari increased in proportion. Survival and growth of teak is good where bamboo was not present. However, a number of Teak plantations failed because of poor site selection. The clear felling was stopped since 1987 because of directives under the Forest (Conservation) Act, 1980. The crop remained unattended and suffered from congestion at many places. The prescribed thinning in the PB-II and the PB-III areas was not done properly. Fire and grazing control was not effective, and consequently, regeneration is inadequate for the most common species.

11.2.9.2 Coppice with Reserve Working Circle: The moderately well stocked mixed forests of predominantly the site quality IVa and IVb were constituted as the Coppice-with-Reserve Working Circle. The working was to be done on fifty-year rotation. Teak plantations over minimum of ten hectare were to be done on suitable sites after clear felling. Sound trees of edible fruit-bearing and economically important non-timber forest produce species like Mango, Chinch, Bhilawa, Jamun, Awla and Achar, Moha, Tendu, Hirda, Kulu and Khair as well as well-grown straight Semal trees were reserved from felling. Teak trees over 60 cm GBH were to be felled in the type I areas, and felling of all trees except reserves was prescribed in the remaining area. Reserves included 100–125 per ha healthy trees of seed-origin and the well-grown saplings and poles (up to 60 cm GBH) of superior species, which do not coppice well. Cutback operations in the following year, fifth-year cleaning and ninth, fifteenth- and twenty-fifth-year thinning were prescribed.

The field-staff perceived the prescriptions as complicated, and the treatment were applied in partial manner without giving due consideration to variation in the crop conditions. Selection of reserves did not reflect due care. Greater proportion of large trees was not felled in the name of conservative marking. Recommendation for clear felling followed by teak plantations was not followed. Aggressive coppicing species like Garari and Lendia started dominating valuable species like Bija, Haldu, Saja, Surya and Dhaora, which are not very good in coppicing. There is a general impression that repeated coppicing has reduced the coppicing vigour of the crop at many places. Tending operations like cleaning and thinning were not properly done.

11.2.9.3 Improvement Working Circle: Poor quality mixed forests of quality IVa and IVb predominantly having mature and over mature trees were in the Improvement Working Circle. Most of the areas were worked earlier under the Coppice-with-Reserve Working Circle of the Benakatti's Working Scheme before the areas was made the Reserved Forests. The area was to be worked on twenty-year felling cycle, and the favoured species were Teak, Bija, Saja, Sissoo, Tiwas, Siwan, Haldu, Kalam, Chichwa, Dhaora, Lendia, Surya, Bhirra, Salai, Mowai and Garari in this order. All silviculturally available mature (trees above exploitable girth) and over mature trees were to be removed. The exploitable girth was fixed at 120 cm GBH for teak, Saja, Bija, Haldu, Kalam and Beheda, 105 cm GBH for Salai, Mowai, Shisham, Siwan Surya and Rohan, 90 cm GBH for Tiwas, Lendia, Dhaora, Kasai, Parad, Bhirra, Chichwa and Kusum and 45 cm GBH for Garari and other species. The retention included sound trees of fruit-bearing species (Mango, Chinch, Bhilawa, Jamun, Kawath and Achar), economically

important non-timber forest produce species (Tendu, Moha, Hirda, Kulu and Khair) and Semal. Dense crop were to be thinned to achieve average spacing at one-third of the average height. Soil conservation measures like gully plugging, loose rubble check dams and brushwood check dams were to be constructed in the eroded and erosion-prone areas. The cutback operations in the following year and cleaning in the sixth-year were prescribed. Cleaning included seedling coppice, singling and spacing out the established regeneration of superior timber species to three-meter interval. Excessive removal was noticed in many areas of this working circle. Tending operations and cleaning were not properly done, and malformed growth remains in the forests.

11.2.9.4 Pasture Working Circle: The areas unsuitable for wood production but suitable for grass were included in the Pasture Working Circle. Large forest blanks with interspersed poor non-teak forests of the site quality IVa to IVb were included in the Pasture Working Circle. Each unit was to be closed for grazing successively for three years in rotation, and thereafter, two sections in each unit were to remain closed to grazing alternatively during the monsoon period from July to October. Seed broadcasting of Sheda, Paonia, Marvel, Stylo and other species of better fodder grass and legume was to be done on ploughed beds. Fodder species like Anjan, Mowai, Bija, Pipal, Guler and Pakar were to be planted at suitable sites. Harvesting of mature and unsound trees was permitted if found necessary. Grazing closures could not be enforced, and fodder and grass plantations were usually unsuccessful.

11.2.9.5 Protection Working Circle: The forests on steep and precipitous slopes forming distinguishable compact blocks were included in the Protection Working Circle. Regular working was not prescribed, but irregular felling for habitat improvement was permitted.

11.2.9.6 Miscellaneous Working Circle: The areas under mining leases, silvicultural experiments and forest nurseries were included in the Miscellaneous Working Circle, which was constituted mainly for the area accounting.

11.2.9.7 Bamboo (Overlapping) Working Circle: The bamboo areas of the division constituted the Bamboo (overlapping) Working Circle. The cutting cycle was three year with standard harvesting prescriptions. The clump cleaning operations included removal of dead, diseased, twisted, bent, malformed and partially cut culms. Clumps were to be considered unfit for harvesting unless eight mature culms were present. All current year culms were to be retained. Only mature culms (more than one year old) were to be removed, but culms equal to the current year recruitment, but not less than eight, were to be retained. The extraction was prohibited during mid-June to mid-October. Illicit cutting of Bamboo causing deterioration of

Bamboo clumps is a major problem in the area, and bamboo yield has reduced. Prescriptions for the event of gregarious flowering were included, but the gregarious flowering did not occur during the period.

11.2.9.8 Wildlife Preservation Working Circle: Habitat improvement was prescribed in the Wildlife Preservation (Overlapping) Working Circle for the entire division. Prescriptions included creating water holes by nala bounding, maintaining den and snag trees, providing salt licks near water holes and awareness generation through wildlife-related hoarding. This working circle is seldom given due importance.

11.2.10 Working Plan of Shri Vinay Kumar Sinha, Shri Arakkal Ashraf & Shri Jarnail Singh for The Period (2003-04 To 2012-13)

This working plan included the Reserved Forests, Protected Forests, Un-classed Forests & Zudpi Jungle of Gondia Division.

Area Included in the Previous Plan: The total area included in this plan is 215929.10 ha which should have been 225603.039 ha. For the purpose of formation of working circles, compartments were used as units for distribution. The allocation of compartments is based on preponderance of suitability to specific working circle.

11.2.10.1 SCI Working Circle. Total area included in this working circle was 76249.82 ha. The entire area 76249.82 ha of this working circle was divided into 25 felling series of average size 3049.99 ha each. Each felling series has been further partitioned in 20 annual coupes of average size 152.50 ha. The special objects of management of this working circle were to obtain sustained supply of large-sized timber, maintain mixed forest nature and high forest character of the forest crop, to improve the proportion of teak and other valuable trees species in the crop by suitable tending operations and providing growing space for naturally regenerated seedlings of such species.

11.2.10.2 Improvement Working Circle: The entire area of 40860.60 ha allotted to this working circle has been divided into 18 felling series, which were divided into 20 annual coupes for treatment. The average area of a felling series is about 2270.03 ha, while the average area of a coupe is about 113.50 ha. The special object of management for this working circle was, to improve the existing crops by tending operations and supplementary plantations, to check soil erosion and conserve soil moisture, the hygienic tending operations will provide small timber, poles and firewood to meet bona fide needs of the local people.

11.2.10.3 Afforestation Working Circle: -

The Afforestation Working Circle included 33104.36 hectares forming 15.3% of the entire forest areas of the division. The entire area of this working circle has been divided into 16 felling series of average size 2071.4 ha. Each felling series has been further divided into 20 annual coupes of average size 103.52 ha. Plantations in this working circle were proposed to be carried out in two-stages- the restorative phase, followed by, planting phase. The special objects of management of constitution of this working circle were, to restore the vegetative cover of these degraded and open areas, primarily, by tending of existing natural regeneration and rootstock and supplementing it with plantations, to improve socio-economic condition of local people. The successful results would provide services of the life-support system, to supply small timber, poles and firewood to meet *bona fide* future needs of the local people, including the *nistar*.

11.2.10.4 Protection Working Circle:- The Protection Working Circle included 8845.00 ha 113 compartments forming 4 percent of the division area. The entire area of this working circle was divided into 2 felling series of average size 4422.5 ha. Each treatment series has been further divided into 20 (twenty) annual coupes of average size 221.12 ha each. The special objects of management of constitution of working circle were as under. The special object of management of this working circle was to protect the fragile forest sites and soil conservation in the catchments of dams and water bodies. No considerable works as proposed in this working circle were carried out.

11.2.10.5 Miscellaneous Working Circle: The rest of the areas of the division were allotted to this Working Circle. A total of 56869.49 ha area was allotted to this Working Circle. Some of areas were under submergence. The prescriptions for the lands with other agencies were only demarcation and fire protection etc. Prescriptions for the land in charge of the Forest department were also the same in addition plantation was also proposed, but no considerable works were carried out in these areas.

11.2.10.6 Bamboo (Overlapping) Working Circle: The total area allotted to this working circle was 34844.04 ha. The area was divided into 16 cutting series. Each cutting series was divided into 3 coupes viz. A, B, C and one of the coupes from each cutting series was to be worked annually. Total number of coupes due for working were 16 each year. The special objects of management of this working circle were, to improve the bamboo productivity for meeting local needs and demand in the surrounding areas, to improve the socio-economic demand of local tribal & non-tribal and burads by giving them bamboo at concessional rate as

well as employment, to development of local inhabitants of this region.

11.2.10.7 Wildlife (Overlapping) Working Circle: The entire of the division were allotted to this working circle. The position of wildlife in Gondia division is fairly good but the distribution of wildlife is uneven. The forests of Gondia division are extremely important as it lies adjacent to, Nawegaon, Nagzira, Sanctuaries. Tadoba, Pench & Kanha National Parks are also nearby. This forest should have been given much more importance for wildlife habitat management and corridor management point of view. But unfortunately, the case was reverse.

11.2.11 Working Plan of Shri T.K.Choubey Working Plan for The Period (2013-2014 To 022-23)

This working plan included the Reserved Forests, Protected Forests, Un-classed Forests & Zudpi Jungle of Gondia Division.

Area Included in the Previous Plan: The total area included in this plan is 1,73,178.596 ha. The allocation of compartments is based on preponderance of suitability to specific working circle.

11.2.11.1 SCI Working Circle. Total area included in this working circle was 63396.438 ha. The entire area 63396.438 ha of this working circle was divided into 31 felling series of average size 2045.00 ha each. Each felling series has been further partitioned in 20 annual coupes of average size 102.25 ha. The special objects of management of this working circle were, to obtain sustained supply of large-sized timber, to maintain mixed forest nature and high forest character of the forest crop, to improve the proportion of teak and other valuable trees species in the crop by suitable tending operations and providing growing space for naturally regenerated seedlings of such species.

Results of Past working: While implementing the prescription of this working circle, following results have been observed.

1. Teak is the principal species and is conformed to patches containing well drained and deep soil. The Growth has been hampered by Grazing and Fire.
2. Heavy Grazing and Fire have resulted in degradation of the area and adversely affected the plantation adjoining the village.
3. Timely Thinning and cleaning in the pole crops and old plantations have not been carried out, leading to congestion in the crop, retarding the growth of valuable species and encouraging the growth of inferior species.
4. The malformed regenerations and advance growths have not been appropriately cut

back leading to increase in the number of malformed and damaged tree growth in the coupe.

5. Even though subsequent operations, vital for the health of the future crop, like CBO, Cleaning, Thinning, Singling, protection from fire and grazing *etc.* have been neglected & even it has been implemented no proper record maintenance has been done. For this word and prescription in the Plan have not been strictly followed leading to deterioration of the crop.
6. Over felling has been done in patches and felling not been spread all over the coupe, thus creating large opening in the canopy.
7. Marking operation has not been completely understood by the field staff. The valuable species have been given priority in marking leading to felling of some rare trees like Haldu and Shisham, which could have been avoided.
8. Improper site selection has led to Teak Plantation being done in dense forest areas in terms reading to suppression of plantation.
9. The areas for Working in the Working Plan in a particular year have also not been completed to the extent prescribed.

11.2.11.2 Improvement Working Circle: The entire area of 22727.188 ha allotted to this working circle has been divided into 12 felling series, which were divided into 20 annual coupes for treatment. The average area of a felling series is about 1894.76 ha, while the average area of a coupe is about 94.73 ha. The special object of management for this working circle was, to improve the existing crops by tending operations and supplementary plantations, to check soil erosion and conserve soil moisture, the hygienic tending operations will provide small timber, poles and firewood to meet bona fide needs of the local people.

Results of Past working: While implementing the prescription of this working circle, following results have been observed.

1. In the main felling coupes dead, dying, malformed matured and over mature trees were removed. But Due to non-working of areas to the extent prescribed in the working plan the crops does not show any major signs of improvement, large areas are under inferior species and valuable species sum to have been represent.
2. Absence of sufficient seedling reproduction and insufficient copies coupled with heavy grazing and fire has resulted in degradation in the area the afforestation works have not been successful.
3. Due to high biotic pressure the preparation of the working plan related to protection

and regeneration could not be implemented effectively. As a result the regeneration status in the areas adjoining the villages, is not satisfactory, however in areas away from the villages, it is satisfactory.

4. Past harvest operation like CBO, Cleaning, thinning, singling, protection from Fire and Grazing etc. Have been appropriately carried out leading to no appreciable improvement in the crop region thus leading to the general deterioration of the area.

11.2.11.3 Afforestation working circle:

The Afforestation Working Circle included 37132.424 hectares forming 21.44% of the entire forest areas of the division. The entire area of this working circle has been divided into 19 felling series of average size 1954.33 ha. Each felling series has been further divided into 20 annual coupes of average size 97.71 ha. Plantations in this working circle were proposed to be carried out in two-stages- the restorative phase, followed by, planting phase. The special objects of management of constitution of this working circle were, to restore the vegetative cover of these degraded and open areas, primarily, by tending of existing natural regeneration and rootstock and supplementing it with plantations, to improve socio-economic condition of local people. The successful results would provide services of the life-support system. To supply small timber, poles and firewood to meet *bona fide* future needs of the local people, including the nistar.

Result of Past working: -

1. As per the prescriptions, the area was to be closed for grazing, high quality grasses were to be planted and protected from fire and grazing, but implementation of these prescription has not been done effectively. Areas taken for afforestation are not as per the sequence of working plan. Two stage afforestation programmes were proposed, which have not been followed at most of the places, while taking plantation under various schemes.
2. Subsequently tending of natural regeneration and root stock has not been done properly, due to which the area under this Working Circle has further deteriorated.
3. Plantation have been taken up at places but have failed due to uncontrolled biotic pressure.

11.2.11.4 Protection Working Circle:- The Protection Working Circle included 8845.00 ha in 113 compartments forming 4 percent of the division area. The entire area of this working circle was divided into 2 felling series of average size 4422.5 ha. Each treatment series has been further divided into 20 (twenty) annual coupes of average size 221.12 ha each. The

special object of management of this working circle was to protect the fragile forest sites and soil conservation in the catchments of dams and water bodies. No considerable soil and moisture conservation works as proposed in this working circle have been carried out.

11.2.11.5 Miscellaneous Working Circle: The rest of the areas of the division were allotted to this Working Circle. A total of 56869.49 ha area was allotted to this Working Circle. Some of areas were under submergence. The prescriptions for the lands with other agencies were only demarcation and fire protection etc. Prescriptions for the land in charge of the Forest department were also the same. In addition plantation was also proposed, but no considerable works have been carried out in these areas.

11.2.11.6 Bamboo (Overlapping) Working Circle: The total area allotted to this working circle was 34844.04 ha. The area was divided into 16 cutting series. Each cutting series was divided into 3 coupes viz. A, B, C and one of the coupes from each cutting series was to be worked annually. Total number of coupes due for working were 16 each year. The special objects of management of this working circle were to improve the bamboo productivity for meeting local needs and demand in the surrounding areas to improve the socio-economic demand of local tribal & non-tribal and burads by giving them bamboo at concessional rate as well as employment, to development of local inhabitants of this region.

Result of Past working: - While implementing the prescription of this working circle, following results have been observed.

1. Bamboo working was mainly confined to the traditional Bamboo areas where the coupe working had been carried out for several cycles, but the areas under plantation could not be worked. The result is that in spite of good survival the clumps have become congested leading to difficulty in working. Some of these clumps are dying due to congestion and recurrent fires.
2. Large number of Burads is in the division who prepare Bamboo articles for their livelihood.
3. Natural Bamboos are also available in the division in some patches, which too have deteriorated due to illicit cutting. Although Large scale plantations have been taken throughout the division, which are successful in varying degrees, at some places clump formation has started and due to lack a systematic working. In these areas, the clumps have become congested in many places.
4. Bamboo plantations in general are satisfactory so far, the survival and growth is concerned. But the Bamboos of these plantations could not be utilization as these

clumps have not been worked in time leading to difficulty in future Working due to congestion of these clumps.

11.2.11.7 Wildlife (Overlapping) Working Circle: The entire division was allotted to this working circle. The position of wildlife in Gondia division is fairly good but the distribution of wildlife is uneven. The forests of Gondia division are extremely important as it lies adjacent to, Nawegaon, Nagzira, Sanctuaries. Tadoba, Pench & Kanha National Parks are also nearby. This Working Circle could have been given much more importance for wildlife habitat management and corridor management point of view.

Result of Past working: - There were several important prescriptions in the said working plan but as per the information provided by the DCF Gondia, most of these prescriptions could not be implemented, hence it is not possible to analyze the impact of this working plan on the health of wildlife.

11.3 SPECIAL WORK OF IMPROVEMENT UNDERTAKEN

Information about special works of improvement undertaken not received.

11.4 PAST YIELD, REVENUE AND EXPENDITURE

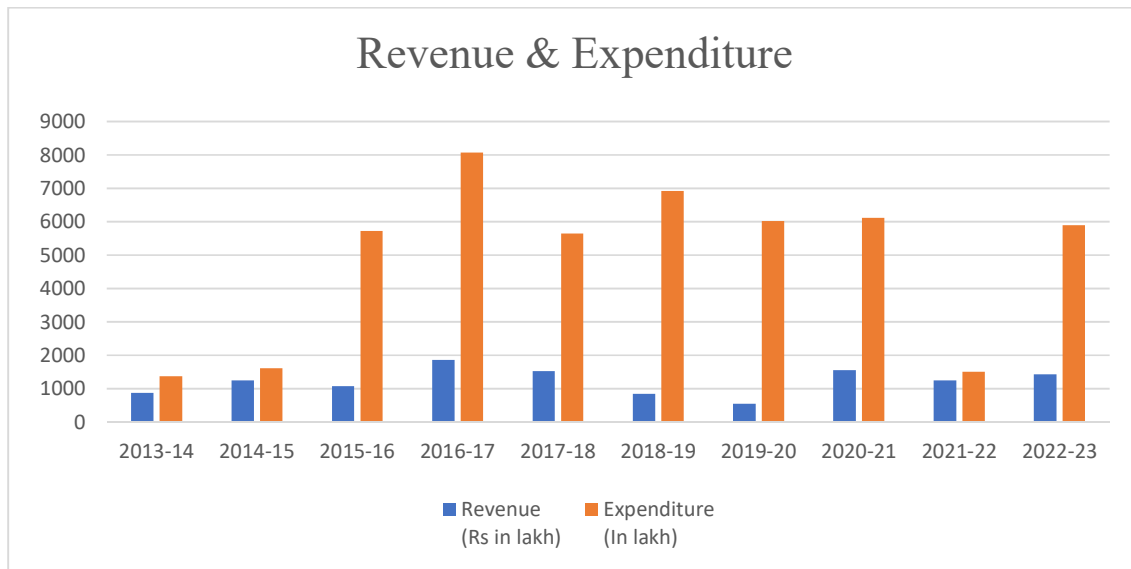
Table No. 11.1 Yield of Timber Fuelwood & Bamboo (SCI/IWC/AFF)

Sr No.	Year	Timber in cu.m	Fuelwood in cu.m	No. of Bamboo
1	2013-14	0	0	243452
2	2014-15	196.458	1341.00	1713896
3	2015-16	1216.479	7511.00	1718133
4	2016-17	1275.08	7825.50	1135054
5	2017-18	3120.195	3544.35	1193828
6	2018-19	1109.536	4280.00	1994874
7	2019-20	544.77	2126.00	591899
8	2020-21	2201.136	7676.00	1270881
9	2021-22	5295.104	15621.00	985966
10	2022-23	1687.772	5330.00	2032100
Total		16646.53	55254.85	12880083

Table 11.2 Revenue and Expenditure and Surplus during plan period

Sr. No.	Year	Revenue (Rs in Lakhs)	Expenditure Rs in Lakhs			Total expenditure (Rs in Lakhs)	Surplus or Deficit (Rs in Lakhs)
			Conservancy and works (Rs in Lakhs)	Establishment (Rs in Lakhs)	Plan (Rs in Lakhs)		
1	2013-14	876.5269	505.2130	0	860.6400	1365.8530	-489.3262
2	2014-15	1254.3190	1050.7192	0	559.7400	1610.4592	-356.1403
3	2015-16	1071.4706	1744.0944	1853.3486	2121.2200	5718.6630	-4647.1924
4	2016-17	1863.7628	1738.9410	3299.8928	3028.4800	8067.3138	-6203.5510
5	2017-18	1520.3056	688.3984	3092.4972	1864.9100	5645.8056	-4125.5001
6	2018-19	846.9545	688.8511	3005.4436	3219.2300	6913.5248	-6066.5703
7	2019-20	551.5805	528.8840	3559.9336	1925.4000	6014.2176	-5462.6371
8	2020-21	1553.3510	576.7353	3827.1682	1708.8590	6112.7624	-4559.4115
9	2021-22	1249.21799	534.0130	0.000	966.6960	1500.7090	-251.4910
10	2022-23	1430.80524	159.96800	4407.23972	1321.855	5889.60272	-4458.25748
Total		12218.29413	8215.8174	23045.52372	17577.03	48838.91112	-36620.07738

Revenue and Expenditure (2013-14 to 2022-23) bar diagram



CHAPTER 12

STATISTICS OF GROWTH AND YIELD

The main species of Gondia Forest Division is Teak. As per India State of Forest Report 2023, the forest cover of Gondia district is 36.37% of total geographical area. Statistics of rate of growth of Teak, Bija, Ain, Dhaoda is already discussed in Chapter 6. Also site quality wise local volume tables for Teak, Ain, Bija, Dhaoda and other miscellaneous species are given in chapter 6.

12.1 STATISTICS OF FOREST CARBON STOCK

12.1.1 Carbon Stock Estimation:

Forests play an important role in combating climate change. In addition, it has the potential to provide ecosystem services, such as carbon storage. Carbon sequestered in the forests of Gondia has been derived by extrapolating from the Growing Stock calculated from the Enumeration data.

Soil Carbon Analysis: Quantum of soil carbon is a good indicator of nutrient status of soil. During the enumeration exercise, SOFR unit collected soil samples (50) and they were analyzed for Soil Carbon. The range of soil carbon varied from 0.4% to 4.4%.

The above efforts have been made but it is apparently inadequate. With the current manpower and the level of expertise available with the department, it will not be possible to immediately come up with definite figures of carbon stock taking into consideration the different pool of carbon, as is expected to be estimated.

Considering the fact that the Forest Survey of India, Dehradun has already come up with the calculation of the current Carbon Stock of India in its publication 'Carbon Stocks of India', this Working Plan has taken advantage of the same. The excerpts from this publication are produced below and a calculation for the carbon stock of Gondia District taking the C-values of the Tropical Dry Deciduous Forests for the State of Maharashtra were extrapolated for this calculation.

12.1.2 Excerpts From FSI's Publication 'Carbon Stock in India's Forests':

Methodology for the assessment of Forest Carbon

The 'Good Practices Guidance' (GPG) developed by Intergovernmental Panel on Climate Change (IPCC) is universally accepted source book for concepts, definitions, various pools, methods, defaults values, various required equations etc. for preparing account of forest

carbon stocks (FCS). Since the subject has been developing in last two decades, many new concepts and methods have emerged but still many challenges remain. The GPG uses the term “Categories” to refer specific sources of emissions/ removals of greenhouse gases. As per the IPCC GPG 2003, the categories are: Forest land, Cropland, Grassland, Wetlands, Settlements and other land. Each land-use category is further subdivided. The following sub-categories are considered for the sector:

Forest land remaining Forest land: An increase in the carbon stocks of Forest Land remaining Forest Land would mean improvement in canopy density and growing stock of forest. A decrease in the carbon stock of Forest Land remaining Forest Land is generally considered as degradation of forest resources.

Land Converted to Forest land: Any non-forest land converted to Forest land would generally be considered as afforestation.

According to GPG, the calculation of GHG inventories require information on extent of area (in case of LULUCF) of an emission/removal category termed as ‘Activity data’ and emission or removal of GHG per unit of area (removal of CO₂ per ha. of added forest area) termed as ‘Emission factors. The main aim is to estimate these factors for the reporting unit. Once these are estimated, the emission or removal can be ascertained using the change in carbon stocks.

The different approaches are given in the GPG to present the activity data (the change in area of different land categories). Approach 1 identifies the total area for each land category; it only provides “net” area. Approach 2 identifies the land conversion between categories by tracking and provides tabular information about land-use conversion. Approach 3 involves, in addition, the spatial tracking of land-use conversion.

The total carbon which is stocked in the forests is divided into several pools and the emission factors are derived from assessments of the changes in carbon stocks in these carbon pools. These factors are developed using estimates which are used at different levels; global, national and sub-national and based on the level the ‘Tier levels’ (Table 12.1) are defined which are independent of the approach being followed.

Table No. 12.1: Three IPCC tiers and data requirements

Tier	Data needs /examples of appropriate biomass data
Tier 1	IPCC default factors: Default MAI (for degradation) and/or forest biomass stock (for deforestation) values for broad continental forest types – default values given for all vegetation – based pools.

Tier 2	Country specific data for key factors: MAI and/or forest biomass values from existing forest inventories and/or ecological studies. Defaults values provided for all non-tree pools. Newly-collected Forest biomass data is required.
Tier 3	Detailed national inventory of key C stocks, repeated measurements of key stocks through time or modelling: Repeated measurement of trees from permanent plots and/or calibrated process models. Can use default data for other pools stratified by in-county regions and forest type, or estimated from process module.

In general, moving to higher tiers improves the accuracy of the inventory and reduces uncertainty, but the complexity and resources needed for conducting inventories also increases with higher tiers.

The Tier 1 approach employs the basic method and default emission factors provided in the IPCC Guidelines (Workbook), Tier 1 methodologies usually use activity data that are spatially coarse, such as nationally or globally available estimates of deforestation rates, agricultural production statistic and global land cover maps.

The Tier 2 approach applies emission factors and activity data which are defined by the country. Tier 2 can also apply stock change methodologies based on country-specific data. Country-defined emission factors/activity data are more appropriate for the climatic regions and land use systems in the country.

At Tier 3, higher order methods including models and inventory measurement are repeated over time and supported by high-resolution activity data and disaggregated at sub-national level. Such systems may use Remote Sensing and GIS tools for tracking land-use change over time.

In Forest ecosystem, enormous carbon is stored which is classified in five pools by GPG. The living portion of biomass carbon is classified in two approaches to emission accounting: the inventory approach and the activity-based approach, which are outlined below. Both approaches are supported under IPCC guidance (IPCC, 2003) and are based on the underlying assumption that the flows of GHGs to or from the atmosphere are equal to changes in carbon stocks in the biomass and soils.

Table No. 12.2: Different Forest Carbon Pools

Pools		Description
Living Biomass	Above ground biomass (AGB)	All living biomass above the soil including stem, stump, branches, bark, seeds and foliage.
	Below ground biomass (BGB)	All living biomass of live roots. Fine roots of less than 2 mm diameter (country specific) are often excluded because these often cannot be distinguished empirically from soil organic matter or litter.
Dead Organic Matter	Dead wood	Includes all non-living woody biomass not contained in the litter, either standing or lying on the ground. Dead wood also includes dead roots and stumps larger than or equal to 10 cm. in diameter or any other diameter used by the country.
Dead Organic Matter	Litter	Includes all non-living biomass with a diameter less than a minimum diameter chosen by the country (for FSI 5 cm.), lying dead, in various states of decomposition above the mineral or organic soil.
Soil	Soil organic matter	Includes organic carbon in mineral and organic soil (including peat) to a specific depth chosen by the country (for FSI 30 cm) and applied consistently through the time series.

Data Acquisition for Forest Carbon Accounting

(i) Collating existing forest data

Forest carbon accounting can make use of existing national, regional or global data. Sources will vary between territories, as well the reliability and uncertainty of the source. However, good quality secondary data reduces both time and cost requirement for accounting.

At a national level, forest inventories, woody biomass assessments, agricultural surveys, land registry information and scientific research can prove useful for land classification and model parameters. Data on temperature, rainfall, soil type and topography should also be sources at smaller scales. In particular, data sources will include national statistical agencies, sectoral experts and universities.

(ii) Using remote sensing

Remote sensing is useful in forest carbon accounting for measurement of total forest area, forest types and canopy cover.

(iii) Data from field sampling

Actual field data is preferable to default data for forest carbon accounting and is required to verify remotely sensed information and generalized data sets. Gathering field measurements for forest carbon accounting requires sampling as complete enumerations are neither practical nor efficient. By definition, sampling infers information about an entire population by observing only a fraction of it. In order to confidently scale up this data to the required geographical level, proper sampling design is vital.

Stratified random sampling is generally used for forest/carbon inventory as mostly forest areas are heterogeneous. Under stratified sampling, forest area is stratified into homogenous strata and samples are selected from each stratum randomly. This provides precise estimates for different strata and also population. Once sample sites have been selected, established methods of biomass inventory are employed for different pools.

Accounting for Forest Carbon Stocks

(i) Above-Ground Biomass (AGB):

The AGB carbon pools consists of all living vegetation above the soil, inclusive of stems, stumps, branches, bark, seeds and foliage. For accounting purposes, it can be broadly divided into two parts viz. trees and understory. The most comprehensive method to establish the biomass of this carbon pool is destructive sampling, whereby vegetation is harvested, dried to a constant mass and the dry to-wet biomass ratio established. Destructive sampling of trees, however, is both expensive and somewhat counter-productive in the context of promoting carbon sequestration. Two further approaches for estimating the biomass density of tree biomass exist and are more commonly applied. The first directly estimates biomass density through biomass regression equations. The second converts wood volume estimates to biomass density using biomass expansion factors (Brown, 1997).

(ii) Below-Ground Biomass (BGB):

The BGB carbon pool consists of the biomass contained within live roots. As with AGB, although less data exists, regression equation from root biomass data have been formulated which predict root biomass data have been formulated which predict root biomass based on above-ground biomass carbon (Brown, 2002; Cairns et al., 1997)

(iii) Dead Organic Matter (wood):

The DOM wood carbon pools include all non-living woody biomass and includes standing and fallen trees, roots and stumps with diameter over 10 cm.

(iv) Dead Organic Matter (Litter):

The DOM litter carbon pool includes all non-living biomass with a size greater than the limit for soil organic matter (SOM), commonly 2 mm, and smaller than that of DOM wood, 10 cm. diameter. This pool comprises biomass in various states of decomposition prior to complete fragmentation and decomposition where it is transformed to SOM.

(v) Soil Organic Matter (SOM):

SOM includes carbon in both mineral and organic soil and is a major reserve of terrestrial carbon (Lal et al., 2001). Inorganic forms of carbon are also found in soil; however, forest management has greater impact on organic carbon and so inorganic carbon impact is largely unaccounted. SOM is influenced through land use and management activities that affect the litter input. In SOM accounting, factors affecting the estimates include the depth of which carbon is accounted, commonly 30 cm. and the time lag until the equilibrium stock is reached after a land use change, commonly 20 years.

12.1.3 Forest Carbon Stock of Tropical Dry Deciduous Forests in Gondia:

The Forest of Gondia division mainly falls in tropical Dry Deciduous Forest. On the basis of above data for forest type of tropical Dry Deciduous Forest in Maharashtra, the carbon stock in Gondia district is estimated as per ISFR 2023 as below:

Table 12.3: Carbon Stock in Gondia District (In 000 tonnes)

Density class	Area (ha)	AGB	BGB	Dead wood	Litter	SOC	Total (3to7)
1	2	3	4	5	6	7	8
VDF	96258	3444.11	1446.75	42.27	624.71	4998.67	10556.51
MDF	66220	1870.71	786.03	9.93	39.73	3302.39	6008.79
OF	27903	340.137	142.86	29.29	12.83	1140.95	1666.06
Total	190381	5654.957	2375.64	81.49	677.27	9442.01	18231.36

Thus, the Gondia District holds 18231.36 thousand tonnes of Carbon in its forests. This data can be used as base line for the future monitoring of the Carbon stock in the Gondia District.

PART II FUTURE MANAGEMENT

CHAPTER 1 BASIS OF PROPOSALS

1.1: OBJECTIVES OF MANAGEMENT

Introduction: This Working Plan has been prepared for the scientific management of the Forests of Gondia Division. The primary management objectives for the Forests of Gondia Division, has been to restore the Forest Resources to its best condition. This plan is intended to focus on future management and sustainable use of the Forest Resources of this Division. The Plan includes the Reserved, Protected, Unclassed forests, and Zudpi Jungle of the Division. Long term Strategic Goals has to be established to guide our steps towards sustainable, ecosystem based forest management. Under the Eco-system based management, equal emphasis is given to ecological, social and economic aspects of the Forest resources.

1.1.1: Ecological Goals

Goal-1: Practice Sustainable, Ecosystem-based Management: Resource Planning and operations will be conducted to maintain the long term integrity, representation, diversity and productivity of terrestrial and aquatic ecosystems; with recognition of valued human activities and uses derived from these systems. Fundamental processes and values of ecosystems shall be protected or rehabilitated. In doing so the following sets of Objectives shall be followed:

Objective-1: Conserve the Geophysical Processes: Emphasise conservation and rehabilitation of geo-physical processes such as soil formation & conservation, geomorphic sedimentation, carbon dynamics, hydrologic dynamics and nutrient dynamics. Such processes are the foundation of the habitat conditions required to sustain desired biological assemblages.

Objective-2: Conserve Biodiversity: Encourage the management of intact, functional landscapes, ecosystems, and communities that will achieve the conservation of representative biological assemblages, including rare species; maintaining local biological diversity at ecosystem, species and genetic level.

1.1.2: Socio-economic Goals

The management of the forests of the Gondia Division will be carried out with the following Goals and objectives:

Goal-1: Maintain Essential Ecosystem Services : The resource planning and operations shall ensure the variety of ecosystem services which includes – natural environment produce resource that are useful to people, including maintenance of air and water quality, ground water recharge, soil conservation, nutrient cycling, carbon sequestration, provision of habitat and biodiversity and attenuation of drought and flood conditions.

Goal-3: Sustain Social-economic Values: The resource planning and operations shall encourage the efficient and sustainable production of desired forest products to provide a range of social and economic benefits.

Goal-4: Provide Public Access: Resource Planning and operations shall be done through participatory management under the JFM scheme to protect and preserve the natural, historic and cultural features of the forest resources while providing access to these resources. While doing so the following sets of objectives shall be followed.

Objective-1: To meet the bona fide requirements of the local peoples, which includes small timber, firewood, fodder and other NTFPs.

Objective-2: To provide ecological education and recreation through Eco-tourism.

Objective-3: To allow the Cultural uses by the indigenous peoples.

1.1.3: General Objectives of Management

Following general objectives of forest management have been identified in pursuance of the National Forest Policy, 1988; and other directives issued by the state and the union governments, from time to time:

1. To preserve forest cover on hill slopes, along streams, watercourses and water bodies in order to prevent soil erosion and to check siltation in reservoirs; and to maintain their essential protective and life support functions, including, regulation of the water regime.
2. To meet expectations of wild life protection and biodiversity conservation from managed forests.

3. To restore and augment tree cover in under-stocked and degraded forests, and to improve productivity and growing stock of natural forests using appropriate modes of management and techniques.
4. To alleviate poverty in the forest dependent villages.
5. To enhance productivity of firewood, fodder, non-wood forest produce, small timber and other construction wood required for meeting local household demands, particularly, of the tribal communities.
6. To involve women community in forestry management.
7. To ensure optimum sustained yield of desirable forest produce and services consistent with other objectives as well as National and State forest policies.
8. Ecotourism
9. The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Rights) Act, 2006 and Joint Forest Management.

The Main Objectives of Management are Listed Below:

1. The forests are primarily mixed in nature and poor in quality, having low proportion of valuable species like Teak and need enrichment by miscellaneous species in the stocking. A large chunk of forest tract is under stocked, open and degraded that needs improvement in stocking through tending of existing rootstock and plantations.
2. The coppice vigour of Teak and miscellaneous species have declined due to repeated coppicing under coppice systems for over 3 to 4 rotations leading to deterioration in growth and quality of Teak and other valuable species. It also has led to increase in proportion of prolific but unwanted coppicers like Garadi and Lendia in the stocking.
3. The natural regeneration of Teak and miscellaneous is not satisfactory. Natural regenerations were observed at places but far short of required numbers as to established natural regeneration to serve as normal future crop.
4. A large extent of forest areas fall in the catchments of irrigation projects and water bodies, thereby need specific treatment in the interest of longevity of these water bodies, having focus on soil and moisture conservation to check siltation.
5. A large portion of forests of the division adjoins the Protected Areas, namely, Nawegaon National Park and Nagzira Wildlife Sanctuary, hence, require treatments in conformity with the wildlife and bio-diversity conservation and eco-tourism.
6. The Bamboo is the most sought after forests produce in the division by the local communities especially the Burads. The uncontrolled Bamboo exploitation has

resulted in shrinking of Bamboo areas in the division. The Bamboo areas require special focus and treatment to reverse this trend.

7. The forests suffer heavy biotic pressure, like, uncontrolled grazing and fire, resulting in destruction of natural regeneration and humus. Besides this the soil becomes compact and unproductive. Excessive grazing and uncontrolled fires are the main adverse factors causing degradation of forests in the division. The situation requires some bold measures to minimise these adverse influences.
8. The NTFP (MFP) species form a substantial proportion of the forest crops that contribute substantially to the livelihood of local communities especially the tribal. The forest areas rich in NTFPs require special thrust for their sustainable management and use in the interest of the local communities, by involving them through JFM and local NGOs having the skill of processing and value addition.

1.1.4: Special Objectives of Management

1. To gradually convert stunted Teak coppice crop with reduced coppicing vigour into 'High Forests' by suitable silvicultural techniques and tending operations in existing natural regenerations and rootstocks.
2. To improve the existing crops by applying improvement measures aimed at nursing back these forests to normalcy.
3. To restore the vegetative cover of degraded and open areas and to increase their productivity, through suitable measures like site protection, tending of natural regenerations & rootstocks, supplementing it with plantations, wherever, necessary, possibly through JFM.
4. To prevent the siltation of the dams and other water bodies by checking the soil erosion in the forest catchments through soil and water conservation measures.
5. To augment fodder requirements of the villages. Mostly it is grass resources, which are to be supplemented, wherever required, with palatable legumes and tree fodder.
6. To improve the productivity of water bodies for the benefit of wild life and villagers.
7. To provide a safe and proper habitat for wild animals and birds.

1.2 METHOD OF TREATMENT TO BE ADOPTED:

The analysis of forest crop is carried out after enumeration of the crop. The species and tree girth distribution from the enumeration data and density distribution from satellite

imageries is used for the purpose. Areas susceptible to high erosion and falling in the catchments of large water bodies are included in the Protection Working Circle.

Compartments under non-forest use, forest nurseries or other special purposes such as Forest Research have not been included under any Working Circle. Therefore such areas have been included in miscellaneous working circle.

Compartments having sufficient dense tree cover and mature trees fit for harvesting are allotted to the Selection-cum Improvement Working Circles (SCI). This working circle is expected to produce large timber and firewood.

Compartments having preponderance of pole crop, dense tree cover without enough mature trees and damaged crop, is designated as the Improvement Working Circles (IWC). These compartments are expected to produce poles, small timber and firewood. Only improvement felling, in favour of desirable species, is to be carried out to improve the crop so that it may become the future Selection Forests.

Areas having sparse tree crops, open areas without tree growth and isolated small forest patches are included in the Afforestation Working Circle. In such areas the focus would be upon tending of existing NR and rootstock, in natural regeneration management, the seedlings of seed origin of desirable species will be given preference over the coppice. If NR is insufficient then it will be supplemented by seedling plantations, wherever necessary. Involvement of the local community is considered focal for management of such areas as well as afforestation of open areas and isolated patches.

1.2.1: Functional Classification of Forests

The broad principles of classification of forests on functional basis have been guided by the Govt. Resolution No. MRF-1365/132211-Y, dated December, 6, 1967 issued by the Government of Maharashtra. The following functional classes have been recognised by the state: -

- **Protection Forests:** It include forests on steep slopes (250 and above), along river banks and the forests that have become depleted through maltreatment and further exploitation of which will accentuate soil erosion and adversely affect the productivity of agricultural lands in the region. The management should aim at conserving these forests, through soil and moisture conservation measures, so that they may exert beneficial influence on the soil, water regime and the physical and climatic factors of the locality.

- **Tree Forests:** These forests are situated in remote tracts that are mainly capable of growing large sized timber and other products of commercial value.
- **Minor Forests:** It includes forests that are interspersed with cultivated lands and are capable of producing small timber and fuel wood and providing grazing which are indispensable needs of adjoining agricultural population.
- **Pasture Lands:** These are openly stocked forests or scrub lands that have ceased to yield even the small timber but are conveniently situated for providing grazing to the cattle used for agricultural works.

Miscellaneous Forests:

- **Grass Reserves:** These are small blocks of forests situated amidst cultivated tracts carrying scrubby growth and capable of producing good fodder grasses.
- Remaining Areas needed for other purposes.

Based on the functional classification of Forests, the various types of forests will be treated as follows:

- A. **Protection Forests:** This type of Forests includes the forest found on Steep slopes (More than 25%), areas along the water courses and in the Catchments of big water bodies. It generally includes good quality forests. They will be managed to protect the area from soil erosion and to minimise the siltation of water bodies. Soil and Moisture Conservation measures will be taken to protect the erosion prone lands and to improve the underground water table. The commercial felling will not be the priority in these areas. These prescriptions have been included for treatment of A-1 type areas of different Working Circles.
- B. **Tree Forest:** This type of forest includes the better-quality forests, especially of good site quality, capable of producing medium to large-sized timber, which are comparatively away from local habitations. They will be managed to produce medium to large sized timber. Steep slopes will be excluded from harvesting operations, but will be covered for soil and moisture conservation works. The natural regeneration will be tended and areas having inadequate natural regeneration will be planted with suitable valuable species. These areas have been included to be worked under SCI Working Circle.
- C. **Minor Forest:** These areas will be managed to meet the local need of small timber, poles and fuel wood. The growing stock is mainly of site quality IVA and IVB. The

density varies from 0 to 0.4 and natural regeneration is deficient in open areas. These forests have been worked under Afforestation Working Circle in the previous plans. Large scale soil and moisture conservation works are proposed to be taken in open and eroded areas. Natural Regeneration and rootstock will be tended and supplemented with Artificial Regeneration of suitable species. The forests will be managed under Afforestation Working Circle, where only hygienic fellings are prescribed.

- D. **Pasture Land:** This area includes forests which are adjoining to villages with heavy biotic interference. They are not capable of producing even small timber and fire wood to any appreciable quantity. These areas will primarily be managed to provide fodder by introducing fodder trees species and superior grasses. Rotational grazing is prescribed. Soil and moisture conservation works will be taken along with planting and sowing of grass seeds. These areas are included in the Grass & Fodder Resources Management Working Circle.
- E. **Zudpi Jungle (Miscellaneous Forests):** These includes the small scattered patches which are handed over by Revenue Department which are unsuitable for any type of working described earlier and areas earmarked for other purposes. These patches are not demarcated on ground. Hence, it is prescribed to demarcate these areas and ensure territorial integrity.

1.2.2: Treatments Prescribed

- i. Management treatments will depend upon requirements of environmental stability, protection of topography, biodiversity conservation, and characteristics of growing stock in the forest and the objectives of management.
- ii. Existing protection forests will be preserved. Soil and moisture conservation works should improve the moisture content and prevent soil erosion and siltation of the water bodies.
- iii. Suitable tending and soil working operations will be carried out to stimulate the growth of the naturally regenerated seedlings and rootstock.
- iv. Timber, if silviculturally available, will be extracted from the dense tree forests capable of producing medium to large-sized timber and poles on sustained basis.
- v. Open forest areas and traditional pastures will be managed with active participation of tribal and village communities for improving the productivity of the land to meet the local domestic needs of fodder and fire wood.

- vi. Uncontrolled grazing, fire, poaching, illicit cutting and uncontrolled encroachment, the major threats for sustainable growth for forest, shall be curbed.

1.2.3: The General Approach of the Treatments

- i. The entire forests on steep and precipitous slopes will be protected from harvesting. 20-meter-wide strips on either side of streams and watercourses will also be protected from harvesting in the similar manner.
- ii. Special habitat management for wildlife conservation will receive high priority. Riparian zones and mesic sites, important for wildlife management, will receive added protection and treatment. Adequate buffer will be provided to such sites while preparing treatment maps for coupe extraction. Snag, den trees and down logs shall be sufficiently protected, to meet the habitat requirement of birds and small animals. Wildlife requirements shall be the most important consideration for water body management in forest areas.
- iii. The forests of Gondia division are extremely important from wildlife management point of view as they intersperse with Bor Tiger Reserve.
- iv. Preference will be accorded to natural regeneration and rootstock management. Natural regeneration and promising coppice growth will receive suitable tending and soil working to stimulate growth and development. Due to poor natural regeneration, Aided NR had to be carried out. Areas treated under natural regeneration shall be protected from fire and grazing. Artificial regeneration will be used as supplementary activity, at places, where natural regeneration is inadequate or is not likely to succeed.
- v. Management of forests close to villages will be given priority for meeting demands of local people for small timber, poles, firewood, fodder, non-wood forest produce, etc. Local people will be actively involved in forest management, forest protection, plantations and development of natural resources in the village. Management of forests close to villages shall primarily be done through JFM committees.
- vi. Non-Timber Forest Produce (NTFP) has great potential for sustainable economic development of local communities with conservation of forest resources. Sustainable NTFP production will be given high priority in the forest management.
- vii. Sustainable use of forest resources will remain the guiding principle for managing the demands of forest produce and services. Various government and non-government agencies will be engaged in identification and promotion of ecologically sound and

- economically feasible alternatives like wood saving technology, stall-feeding, population control of cattle and livestock improvement.
- viii. Involving local people in managing forests and generating awareness in rural and tribal areas is considered indispensable for the forest conservation.
 - ix. Reducing biotic pressure on forests, particularly, illicit felling, unsustainable grazing, fire and encroachment near villages will be considered on priority basis.
 - x. Forests capable of producing medium to large sized timber will be harvested under the Selection-Cum-Improvement management system.
 - xi. Boundary demarcation will be carried out in time-bound manner for ensuring territorial integrity of forests.
 - xii. Action will be taken to convert all the Zudpi jungles adjoining the Reserved Forests and large patches, away from villages into Reserved Forests.

1.3: CONSTITUTION OF WORKING CIRCLES

1.3.1: Working Circles and Their Distribution

For the scientific management of forests, a compartment has been used as a unit for distribution. The allocation of compartments is based on preponderance of suitability to specific working circle. In all Five area-specific and three overlapping, working circles are prescribed. (Abstract of allotment of compartment to various Working Circles and Felling series is given in **Appendix No. XXI**)

Distribution of Area to Various Working Circles: The allocation of forest areas under various working circles of the current working plan has been given in Table No. 1.1

Table No.1.1: Area Allocation to Different Working Circles

Sr. No.	Name of Working Circle	Area allocated (Ha)
1	Selection-Cum-Improvement Working Circle	62561.968
2	Improvement Working Circle	22648.129
3	Afforestation Working Circle	34078.693
4	Protection Working Circle	11318.628
5	Miscellaneous Working Circle	38281.728
6	Wildlife (Overlapping) Working Circle	Entire area
7	Bamboo (Overlapping) Working Circle	33371.918
8	NTFP (Overlapping) Working Circle	Entire area
9	JFM (Overlapping) Working Circle	55037.566
	Total	168889.146

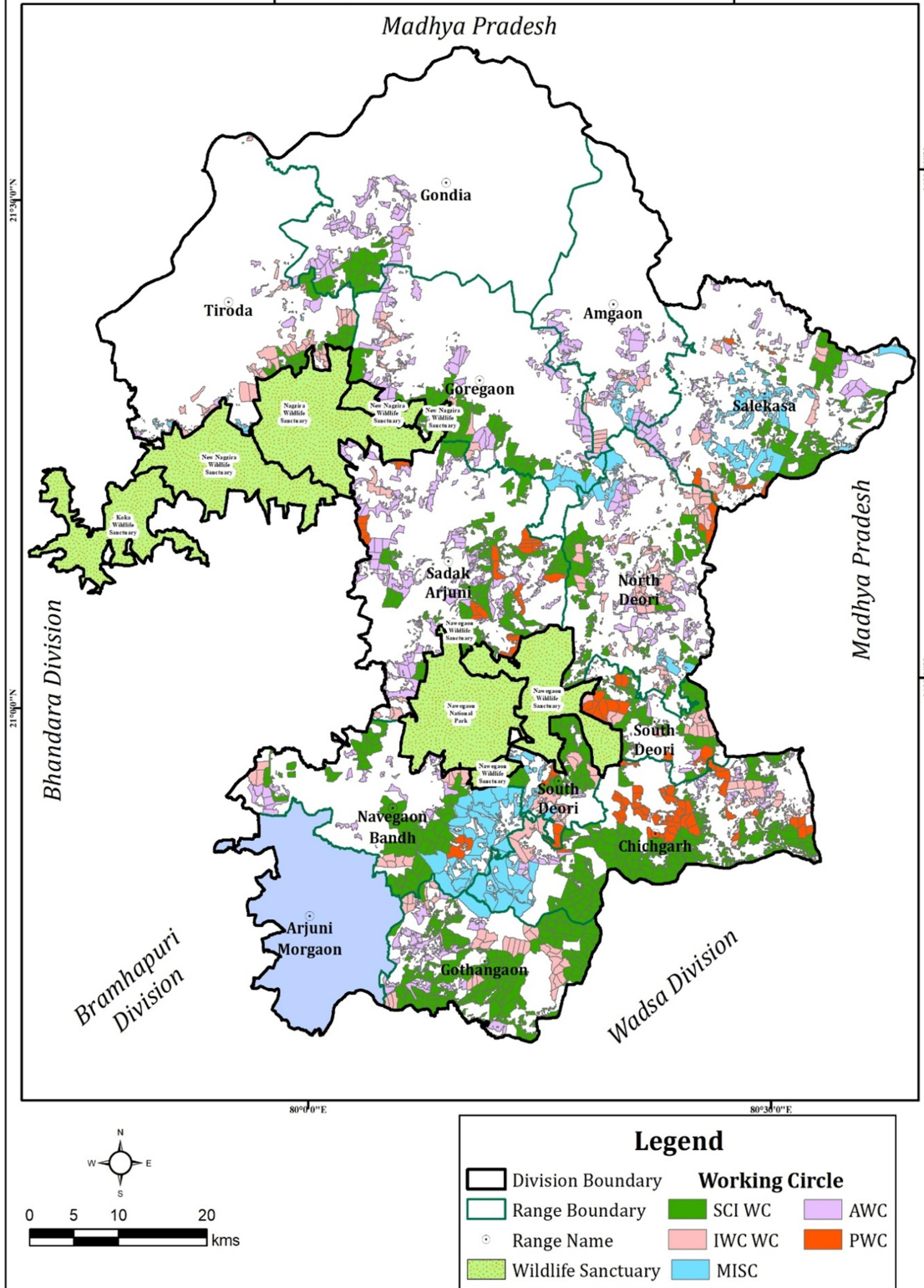
**Table No. 1.2: Table of Comparison between Earlier and Present Plan Working Circle
Wise Distribution**

Sr. No.	As per Old Plan	Total Area (Ha.)	As per proposed Plan	Total Area (Ha.)
1	Selection-cum Improvement Working Circle	63396.438	Selection-cum Improvement W C	62561.968
2	Improvement Working Circle	22737.188	Improvement W C	22648.129
3	Afforestation Working Circle	37132.424	Afforestation W C	34078.693
4	Protection Working Circle	11763.778	Protection W C	11318.628
5	Miscellaneous W C	38148.768	Miscellaneous W C	38281.728
	Total	173178.596	Total	168889.146
6	Wildlife (OL)W C	Entire area	Wildlife (OL)W C	Entire area
7	Bamboo (OL)W C	34253.987	Bamboo (OL)W C	33371.918
8	NTFP (OL)W C	Entire area	NTFP (OL) W C	Entire area
9	JFM (OL)W C	Entire area	JFM (OL)W C	55037.566

1.4: PERIOD OF WORKING PLAN AND NECESSITY FOR INTERMEDIATE REVISION

Period of the Plan: This plan will be implemented for a period of 10 (Ten) years from the year 2023-24 to 2032-33. However, the mid-term review shall be carried out as per guidelines of National Working Plan Code, 2023 and MOEF&CC conditions given in letter no. F.No.:12-56/98(FOR)/14290 dated 29.05.2025.

Map Showing Various Working Circles Gondia Forest Division



CHAPTER 2

SELECTION-CUM IMPROVEMENT WORKING CIRCLE

2.1: SELECTION- CUM IMPROVEMENT WORKING CIRCLE

The area of this Working Circle has been clearly marked on the GIS based map of 1:50000 which is appended as Management Map in the Plan and a copy of the same is given on a smaller scale on A4 size here.

2.2: GENERAL CONSITUTION OF THE WORKING CIRCLE

The areas capable of producing primarily large timber are allotted to this working circle. It predominantly includes areas which support straight bole and sound trees of both seedling and coppice origin. It includes 62561.968 ha of total area comprising of 38236.929 ha. of reserved forests and 23016.182 ha of protected forests & Unclassed Forest is 1308.857 ha. It constitutes an area of about 37.043 % of the total forest area of the division.

Based on the results of the enumeration data and satellite imageries and existing stock map details, the following criteria is proposed for allocation of compartments to the SCI areas:

1. Compartments suitable for producing timber of medium and large size and not critically important for the protection of the topography.
2. Compartments having dense Teak Forest of IVA quality having patches of quality III and IVB inextricably mixed in the crop, capable of producing timber and poles.
3. Compartments having more than 20 hectare of dense tree cover, more than 10 trees per ha of harvestable girth and more than 8 square m in basal area are included in SCI, subject to the above condition.

Area Statement: Range-wise allocation of Compartments and area is shown in the table below:

Table No.2.1: Range-wise Allocation of Compartments and Area

S. N	Range	RF		PF		Unclassed (Total Comptt.)	Unclassed Area (In ha)	Total Comptt.	Total (in. ha)
		No. of Comptt	Area in ha.	No. of Comptt	Area in ha.				
1	Tiroda	6	1374.054	3	316.091	0	0	9	1690.145
2	Gondia	2	977.551	4	1495.055	0	0	6	2472.606
3	Goregaon	6	1054.733	11	2820.433	1	180.532	18	4055.698
4	Amgaon	0	0.00	0	0	0	0	0	0
5	Salekasa	14	2741.270	8	2041.631	0	0	22	4782.901

6	North Deori	7	1313.200	12	2827.963	0	0	19	4141.163
7	South Deori	8	1775.700	13	4120.058	0	0	21	5995.758
8	Chichgarh	30	7725.200	12	4523.622	0	0	42	12248.822
9	SadakArjuni	16	3515.637	11	2272.066	2	70.600	29	5858.303
10	Nawegaon bandh	25	6150.224	4	517.713	0	0	29	6667.937
11	Ghothang aon	33	7564.680	10	1523.153	9	1057.725	52	10145.558
12	Arjuni Morgaon	19	3944.680	5	558.397	0	0	24	4503.077
Total		166	38136.929	93	23016.182	12	1308.857	271	62561.968

2.3: GENERAL CHARACTERSTICS OF VEGETATION

The forests are mixed in nature and contain trees of all age classes.

The crop consists mainly of miscellaneous species with varying proportions of teak. In some compartments pure Teak trees are also present, but they are confined to the well drained areas, mainly along the major nalas and area consisting of good loamy soil. The major miscellaneous species are Saja, Bija, Kalam, Haldu, Tiwas, Dhaoda, Garadi, Mowai, Rohan, Bhirra, Surya, Lendia, Chichwa, Parad etc. In the fruit bearing species, Tendu, Moha, Char, Aonla, Bel, Harra and Beheda are the main species. Haldu and Shisham are confined to a few compartments. Garari and Lendia are abundant in pole crop, and adversely affect regeneration and growth of other light-demander species. Natural Bamboos are very less, but in many compartments Natural as well as artificially planted bamboo crop occurs extensively in the entire division. Kuda, Garadi, Decamali are the main species in the understory.

As per the enumeration results, composition and structure of forest crop in SCI area is given in the **Table No.2.2**.

The crop is young to middle aged with occasional mature trees, in the major portion. The density of the crop is 0.4 to 0.8. The quality of the crop is III to IVA with some open patches of IVB mixed with above qualities. Dominant site qualities are III and IVa, but areas of site quality IVb is also not uncommon. Some patches of site quality II are also seen in the division. Natural regeneration of almost all species is present. But the establishment of natural regeneration varies from place to place. In the area subjected to annual fires and heavy grazing, the establishment is less. But the overall position of the natural regeneration is satisfactory. The advantage of this regeneration will be taken to regenerate the area. Although proportion of teak is small, the forests are suitable for teak. Hence, proportion of teak could be increased by suitable tending operations.

Table No. 2.2 Species & Girth wise Distribution (per ha) in SCI WC

Species	g15 30	g31 45	g46 60	g61 75	g76 90	g91 105	g106 120	g121 135	g136 150	g151 up	Total	Basal Area (m ²)
Ain	4.756	3.062	1.976	1.744	1.534	1.063	0.696	0.447	0.263	0.327	15.869	0.566
Aonla	0.377	0.449	0.322	0.207	0.166	0.082	0.045	0.007	0.005	0.002	1.662	0.044
Behada	0.204	0.158	0.171	0.130	0.109	0.053	0.055	0.031	0.031	0.083	1.025	0.052
Bel	0.170	0.139	0.066	0.065	0.038	0.039	0.017	0.005	0.003	0.006	0.550	0.016
Bhirra	1.392	1.184	0.805	0.477	0.378	0.214	0.096	0.037	0.041	0.044	4.668	0.122
Biba	0.314	0.420	0.298	0.166	0.139	0.097	0.048	0.029	0.014	0.034	1.558	0.052
Bija	0.564	0.647	0.684	0.832	0.877	0.825	0.649	0.430	0.297	0.400	6.204	0.416
Bor/Ber	0.000	0.008	0.004	0.006	0.001	0.003	0.000	0.000	0.000	0.000	0.023	0.001
Char	1.924	1.855	0.948	0.454	0.284	0.087	0.042	0.011	0.005	0.006	5.614	0.097
Chichwa	0.121	0.177	0.177	0.164	0.164	0.070	0.065	0.031	0.035	0.035	1.039	0.050
Dhaman	0.247	0.299	0.254	0.181	0.125	0.056	0.018	0.014	0.007	0.004	1.205	0.034
Dhawada	2.974	2.114	1.403	1.037	0.809	0.442	0.274	0.153	0.084	0.158	9.447	0.277
Garadi	6.940	4.953	3.375	2.003	1.185	0.461	0.203	0.060	0.034	0.018	19.233	0.373
Haldu	0.134	0.136	0.102	0.048	0.079	0.073	0.056	0.035	0.031	0.076	0.771	0.046
Hirda	0.259	0.232	0.151	0.127	0.104	0.079	0.046	0.039	0.029	0.029	1.096	0.044
Kalam	0.108	0.096	0.081	0.054	0.076	0.054	0.051	0.041	0.017	0.039	0.617	0.035
Kasai	0.341	0.455	0.463	0.322	0.254	0.121	0.068	0.034	0.026	0.050	2.133	0.078
Khair	0.282	0.451	0.323	0.182	0.114	0.030	0.007	0.009	0.001	0.000	1.399	0.031
Kulu	0.038	0.048	0.041	0.019	0.004	0.008	0.000	0.000	0.006	0.012	0.179	0.007
Lendia	4.651	2.374	1.085	0.566	0.460	0.204	0.100	0.052	0.046	0.049	9.588	0.167
Moha	1.009	0.842	0.599	0.414	0.464	0.379	0.354	0.230	0.220	0.623	5.133	0.322
Mokha	0.074	0.078	0.056	0.067	0.074	0.048	0.017	0.017	0.009	0.026	0.467	0.023
Mowai	0.696	0.811	0.708	0.638	0.547	0.355	0.220	0.135	0.089	0.082	4.281	0.179
Other	6.13	5.59	3.64	2.26	1.64	0.89	0.57	0.41	0.29	0.71	22.13	0.71
Palas	1.063	0.828	0.680	0.468	0.394	0.187	0.099	0.062	0.042	0.032	3.855	0.114
Rohan	0.990	0.842	0.582	0.400	0.302	0.167	0.080	0.052	0.026	0.020	3.463	0.094
Salai	0.168	0.203	0.239	0.197	0.280	0.274	0.210	0.172	0.167	0.204	2.115	0.163
Semal	0.081	0.075	0.099	0.081	0.069	0.068	0.053	0.038	0.023	0.024	0.611	0.034
Shisham	0.113	0.182	0.157	0.165	0.125	0.032	0.026	0.008	0.003	0.004	0.815	0.026
Shiwan	0.087	0.058	0.065	0.034	0.057	0.013	0.010	0.010	0.003	0.011	0.347	0.013
Surya	1.105	1.277	0.991	0.665	0.476	0.249	0.101	0.042	0.025	0.022	4.954	0.135
Teak	8.135	3.980	1.441	0.635	0.455	0.335	0.233	0.150	0.111	0.137	15.612	0.274
Tendu	1.721	0.496	0.223	0.170	0.133	0.108	0.059	0.050	0.026	0.042	3.028	0.065
Tiwas	0.194	0.244	0.185	0.184	0.251	0.163	0.082	0.044	0.033	0.028	1.409	0.066
Total	47.360	34.760	22.393	15.162	12.171	7.328	4.651	2.886	2.048	3.339	152.099	4.728

2.4: FELLING SERIES, CUTTING SECTIONS AND JFM AREAS

The entire area of this working circle has been divided into 31 Felling Series with an average area of 2018.12 ha. and each felling series is further divided into 20 coupes with an average area of 100.90 ha. (Details in **Appendix No. XXV**)

2.5: BLOCKS, COMPARTMENTS AND JFM AREA (MARKED ON GIS BASED MAPS)

Details of block and compartment wise area distribution is given in the **Appendix No. XXIII.**

2.6: SPECIAL OBJECTIVES OF MANAGEMENT

The special objects of management of the forest areas under this Working Circle are as under:

1. To gradually convert stunted Teak and other valuable coppice crop with reduced coppicing vigor into 'High Forest' by suitable silvicultural techniques and tending existing natural regeneration of seed origin.
2. To obtain sustained supply of medium to large-sized timber and poles.
3. To maintain mixed forest composition and High Forest character of the forest crop and improve density of stocking by tending existing natural regeneration and supplementing it with artificial regeneration of suitable valuable species.
4. To improve the proportion of valuable miscellaneous tree species in the crop by suitable tending operations and providing growing space for naturally regenerated seedlings of such species.

2.6.1: ANALYSIS OF THE CROP

Stock Mapping: The conventional stock mapping has also been carried out, besides the extensive enumeration exercise and crown density mapping through image processing and analysis of the satellite imageries.

Age and Density: The crop is mostly middle aged to mature having density varying from 0.4 to 0.8. The dense forest areas form about 3/4th of the crop in SCI areas.

Site Quality: Site quality governs the harvestable girth. It can be determined by average height of about 100 matured dominant Teak trees or its associates in the forest patches of consistent characteristics. However, site quality does not change much in time span of 20 years and hence the information from the previous plan has been used to delineate and digitize the various site quality classes.

Enumeration: Enumeration was carried out in the previous working plan period in 1412 plots over an area of 63396.438 ha. Inventory works included complete enumeration of species and girth distribution of all trees, regeneration and recording of site quality and density. This data was used for girth class wise and basal area distribution of different species, which was further used for area allocation to various working circles. Analysis of the data collected from these sample plots is given in **Appendix No. XX**.

Regeneration: Data on regeneration status was collected along with enumeration of the crop. The data has been analyzed and used to devise prescriptions for regeneration of forest areas by both natural as well as artificial means. The focus is on tending of existing

natural regeneration. The seedlings of seed origin are preferred over the regeneration through root stock.

Plantation is proposed only as a supplementary activity limited to the extent to fill the deficiency in natural regeneration, on the degraded and blank areas (excluding natural blanks).

2.6.2: Silvicultural System

SCI System prescribes removal of mature trees above the harvestable girth to create openings in the tree canopy, thereby, facilitates tree growth in the lower girth classes. It supports establishment of natural regeneration of Teak and other valuable light demander species. This system has advantages over, the clear felling and coppice systems, in its ability to address the issues related to the biodiversity conservation and maintenance of site conditions and Mixed and High Forest nature of the forest crops.

Besides, the forests of Gondia division are primarily mixed in nature, having a few valuable species of good coppicing nature. In addition they have a significant proportion of Garari and Lendia - the prolific coppicing species- adversely affecting the extent and quality of teak and other valuable species in the crop composition. Except Teak, forests of Gondia.

Division support very few valuable species of good coppicing nature. Moreover, a significant part of these forests have been worked under Coppice Systems for 4 successive rotations leading to reduction in their coppicing vigour. In view of these reasons, coppice systems are not considered suitable for the future management of the forests of Gondia Division.

In view to above, and to maintain the mixed composition and High Forest character of the forest crop and to achieve the objective of management, these forests are proposed to work under SCI working circle. Local demands of small wood can also be met from SCI coupes.

Forest areas containing dense pole crops will be thinned along with coupe working. Growth of naturally regenerated pole crop will be encouraged by the tending, cleaning operations and improvement felling as well as protection from fire and grazing.

The natural regeneration will be given proper scientific treatments to regenerate the area.

The areas poor in natural regeneration will be artificially regenerated by Teak, miscellaneous species and Bamboo. Plantations will not be taken up in SCI areas unless a minimum 5 ha of degraded area, having crown density less than 0.4, is available in an annual coupe.

2.6.3: Rotation Period: Rotation Period according to steam analysis result of Teak is 99 years where as Bija is 89 years, Ain -100 years Dhaoda -88 years.

2.6.4: Harvestable Diameters: Harvestable girth for various important species, in SCI working circle, has been determined at maximum volume production as per the CAI & MAI curves in stem analysis exercises, carried out by the then CCF Working Plan Nagpur. The details are given in the **Table No. 2.3**.

Table No.2.3: Table showing the Harvestable Girth for Various Species in the Division

Species	Harvestable Girth
Teak	135 cm for quality III (If found)
	120 cm for quality IV
Ain, Bija, Haldu and Kalam.	135 cm for quality III (if found)
	120 cm for site quality IV
Dhaoda, Tiwas, Surya, Shisham, Rohan, Bhirra, Kasai, Mokha, Palas, Dhaman, Bhilawa, Chichwa, etc.	90 cm for site quality IV
Garadi, Lendia	45 cm for site quality IV
Species protected from felling (Semal, Kullu, Beheda, Karai, etc. and all fruit trees)	No felling

2.6.5: Reducing Factors and Reduced Areas: Not applicable

2.6.6: Felling Cycle: Each felling series has been divides into 20 annual coupes, so the felling cycle has been fixed at 20 years. In this working plan coupe no. XI of previous plan is considered as coupe no. I and so on.

2.6.7: Division into Periods and Allotment to Periodic Block (Pb): Not applicable as Shelter wood system is not adopted for this Working Circle.

2.6.8: Calculation of The Yield: The yield is regulated by area. The annual yield will be regulated by area by making coupes equi-productive in each felling series, as far as possible. Coupes of around 102 ha each, will be laid down. From the enumeration data of SCI WC of this working plan, the average number of stems per ha have been calculated. For the purpose of yield, data of each species mentioned above is used. The data is as under.

Table No. 2.4: Table Showing Abstract of Enumeration Data

S.N	Girth Class (cm)	Group-I (Teak)	Group-II (Ain, Bija, Haldu, Kalam)	Group-III (Dhaoda, Khair, Bhirra, Chichwa, Salai, Mowai, Rohan, Shivan, Shisham, Tiwas, Surya, Kasai, Mokha, Palas, Dhaman, Bhilwa.)	Group-IV (Lendia, Garadi)	Grand Total
1	15-30	8.413	5.94	11.649	13.673	39.677
2	31-45	4.571	4.38	11.384	9.342	29.677
3	46-60	1.836	3.26	8.781	5.768	19.643
4	61-75	0.833	3.03	6.287	3.301	13.449
5	76 - 90	0.605	2.93	5.342	2.013	10.888
6	91 - 105	0.418	2.26	2.884	0.769	6.332
7	106 - 120	0.295	1.61	1.659	0.336	3.904
8	121 - 135	0.212	1.04	0.966	0.126	2.341
9	136 & above	0.150	0.79	0.750	0.084	1.774
	Total	17.333	25.239	49.702	35.411	127.685

Survival Percentage: The percentage of trees, that will be reaching the harvestable girth has, been calculated on the basis of number of trees that should have been in each girth class, if the present stock was evenly balanced. The expected number of trees in different girth classes in an evenly balanced growing stock is what is obtained from the law of F. De Liocourt.

F. De Liocourt's Law: This formula was used for the yield calculation in the previous working plan hence it has been adopted in this working plan too. The theory states that in a fully stocked selection forest i.e. the normal growing stock of the uneven aged forests, the number of stems falls off from one diameter class to the next higher diameter class in a geometrical progression with a constant ratio. This means that the percentage reduction in the stem number from one diameter class to the next is constant. Although the numerical value of the ratio varies from one forest to another, the general form of the distribution follows an exponential curve of decrease in number of trees as diameter increase is a fundamental characteristic of the uneven aged condition which provides the basis for the concept of uneven aged normally.

Thus, according to the law of F. De Liocourt, the number of trees in successive diameter or Girth classes represents a geometrical series of the form. $a, ar-1, ar-2, ar-3$

Where 'a' represents the number of trees in the lower diameter/girth class, $ar-1$ the number in the next higher diameter/girth class, $ar-2$ the number in the next higher diameter/girth class and so on and 'r' represents the common ratio of the geometrical progression. If the value of 'r' and the number of stems in any class are known, the whole series can be worked out and this would give the proportionate distribution of stems of an evenly balanced composition in an ideal selection forest. The numerical values of 'r', which is

the ratio of the geometric series, can easily be calculated if the stand table of such an ideal forest is available. By dividing the number of tree in a given diameter class by the number of trees in the next higher diameter class will give the value of 'r', which will be constant throughout all diameter/girth classes if the distribution is balanced. But in actual, such balanced distribution does not exist due to a number of reasons. In order to visualize an ideal distribution for a given actual distribution, the above law is applied.

For a given stand table the value of 'r' and 'a' are obtained as follows:

(A) Calculation of 'r' :

'r' can be calculated by 3 methods. They are as follows:

a) The average (arithmetic mean) of the successive ratios. If a₁, a₂, a₉ are number of stems in 9 girth classes, then

$$r = \frac{1}{8} = \frac{a_1}{a_2} = \frac{a_2}{a_3} = \dots = \frac{a_8}{a_9}$$

b) Since $\frac{a_1}{a_2} = \frac{a_2}{a_3} = \dots = \frac{a_8}{a_9}$

and so $\frac{a_1 + a_2 + \dots + a_8}{a_2 + a_3 + \dots + a_9} = r$

c) Since $\frac{a_1}{a_2} = \frac{a_2}{a_3} = \frac{a_8}{a_9} = r$

and therefore $\frac{a_1}{a_2} = \frac{a_2}{a_3} = \frac{a_8}{a_9} = r$, or $r = \frac{a_1}{a_3} = \frac{1}{8}$

The value of 'r' can be calculated from any of the three methods, mentioned above, but (a) and (b) involves all terms of the series to find out the average value, whereas the in last one only two terms are required, and so these two (a & b) are more appropriate. Between (a)

and (b), (a) includes ratio of higher girth classes, which contains fewer trees and so the chance of error is more and the estimate of 'r' may have more standard error, and therefore method (b) appears to be most appropriate one and the same is being applied in the subsequent calculation.

(B) Calculation of the First Term of Geometrical Progression:

The sum of n terms of a G.P. is given as

$$S = a + ar^{-1} + ar^{-2} + ar^{-3} \dots\dots\dots + ar^{-(n-1)}$$

Where 'a' is the number of stems in the lower girth class.

Multiplying both sides by 'r' and subtracting it from the former, we get the following :

$$a = s (r^{n-1}) (r - 1) / (r^{n-1})$$

Here 'S' is the some of stems of all girth/dia classes which is known and 'r' has been calculated as above. Therefore, the value of 'a' can be calculated. From these 'a' and 'r' the whole series of an ideal distribution for a given stem distribution can be found out. The same principle is applied hereafter to construct the table for different harvestable girth.

Yield Calculation for Group-I Species (Teak)

Table No. 2.5: Table Showing Average Annual Recruitment for Teak

Harvestable girth 120 cms.

Girth Class	Stem per ha	Stem/ha as per De Liocourt's Law	% of survival	Stem/ha reaching harvestable girth [(2 x4)/100]	Years required to pass over next girth class	Average annual recruitment (5/6)
1	2	3	4	5	6	7
15-30	8.413	8.360	2.871	0.242	10	0.024 R1
31-45	4.571	4.310	5.568	0.255	10	0.025 R2
46-60	1.836	2.110	11.374	0.209	12	0.017 R3
61-75	0.833	1.230	19.512	0.163	13	0.013 R4
76 - 90	0.605	0.840	28.571	0.173	14	0.012 R5
91 - 105	0.418	0.560	42.857	0.179	15	0.012 R6
106 - 120	0.295	0.370	64.865	0.192	18	0.011 R7
121 - 135	0.212	0.240	100.000	0.212		
136 & above	0.150	0.150	100.000	0.150		
Total	17.333					

In the above table by De Liocourt's formula

$$a_1 + a_2 + \dots\dots\dots + a_8$$

i) $r = \dots\dots\dots$

$$a_2 + a_3 + \dots\dots\dots + a_9$$

$$\begin{aligned}
& 8.413 + 4.571 + \text{-----} + 0.212 \\
& = \text{-----} \\
& 4.571 + 1.836 + \text{-----} + 0.150 \\
& 17.18 \\
& = \text{-----} = 1.93 \\
& 8.92
\end{aligned}$$

$$\begin{aligned}
\text{and } S &= a_1 + a_2 + \text{-----} + a_9 \\
&= 8.413 + 4.571 + \text{-----} + 0.150 \\
&= 17.333
\end{aligned}$$

$$\begin{aligned}
\text{ii) } a &= s (r^{n-1}) (r - 1) / (r^n - 1) \\
&= 17.333 \times (189.67)(0.93) / (365.37-1) \\
&= 3056.89 / 364.37 \\
&= 8.36 = \text{Recruitment in successive three felling series.}
\end{aligned}$$

Felling Cycle	Total Recruitment
1) 18R7 + 2R6	= 0.192+0.024 = 0.215
2) 13R6 + 7R5	= 0.155+0.086 = 0.242
3) 7R5 + 13R4	= 0.086+ 0.163 = 0.249

Realizable recruitment in successive three felling cycles

a) First Felling Cycle

$$\begin{aligned}
\text{i) } R_{r_1} &= \frac{1}{2} \{0.215 - 18 (0.215/ 20 - 0.011) \} \\
&= \frac{1}{2} \{0.215 - 18 (0.01075 - 0.0110) \} \\
&= 0.1065
\end{aligned}$$

ii) Available recruitment Ra₁

$$\begin{aligned}
Ra_1 &= 0.215 - 0.1065 \\
&= 0.109
\end{aligned}$$

b) Second Felling Cycle

$$\begin{aligned}
\text{i) } R_{r_2} &= \frac{1}{2} \{0.242 - 13x (0.242/ 20 - 0.012)\} \\
&= \frac{1}{2} \{0.242 - 13 x (0.0121 - 0.0120)\} \\
&= \frac{1}{2} (0.242 - 0.0013) = 0.1198
\end{aligned}$$

ii) Available recruitment Ra₂

$$Ra_2 = 0.242 - 0.1198 = 0.1220$$

c) Third Felling Cycle

$$\begin{aligned} \text{i) } R_{r_3} &= \frac{1}{2} \times \{0.249 - 7 \times (0.249 / 20 - 0.012)\} \\ &= \frac{1}{2} \times \{0.249 - 7 \times (0.01245 - 0.0120)\} \\ &= \frac{1}{2} \times (0.249 - 0.00045) = \frac{1}{2} \times (0.248) = 0.124 \end{aligned}$$

ii) Available recruitment Ra2

$$\begin{aligned} Ra_3 &= 0.249 - 0.124 = 0.125 \\ Ra_2 &= 0.242 - 0.1198 = 0.1220 \end{aligned}$$

c) Third Felling Cycle

$$\begin{aligned} \text{i) } R_{r_3} &= \frac{1}{2} \times \{0.249 - 7 \times (0.249 / 20 - 0.012)\} \\ &= \frac{1}{2} \times \{0.249 - 7 \times (0.01245 - 0.0120)\} \\ &= \frac{1}{2} \times (0.249 - 0.00045) = \frac{1}{2} \times (0.248) = 0.124 \end{aligned}$$

ii) Available recruitment Ra₂

$$Ra_3 = 0.249 - 0.124 = 0.125$$

Table No. 2.6: Table Showing the Net Realizable Recruitment

Felling Cycle	Total Recruitment	i. Realizable ii. Accumulation	Net Realizable Recruitment	Annual average realizable (4/20)	Annual average volume (in cum)
1	0.215	0.1065	0.1065	0.0053	0.0036
		0.1089			
2	0.242	0.1199	0.2287	0.0114	0.0078
		0.1217			
3	0.249	0.1242	0.2459	0.0123	0.0084
		0.1249			

Yield in First Three Felling Cycles:

The existing number of stems per ha above 120 cm girth is 0.362 which will be liquidated in first three cycles. The annual liquidation will be 0.00603 stems/ha or 0.0041 m³/ha. Thus the annual average yield in the first, second and third cycle will be 0.0077 m³, 0.0119 m³ and 0.0125 m³ per ha respectively. The total area of the Working Circle is 62561.968 ha. Hence for yield calculation the 62561.968 ha. area should be used. Reserving 50% as the future safeguard, the utilizable yield in three cycles will be 0.0039 m³, 0.0059 m³ and 0.0062 m³ respectively, and the estimated annual yield for the whole working cycle for three cycles will be 247.25 m³, 374.04 m³ & 393.06 m³ respectively.

Yield Calculation for Group-II Species (Ain, Bija, Haldu, Kalam)

Table No. 2.7: Table Showing Annual Average Recruitment

Harvestable girth 120 cms

Girth Class	Stem per ha	Stem/ha as per De Licourt's Law	% of survival	Stem/ha reaching Harvestable girth [(2 x 4)/100]	Years required to pass over next girth class	Average annual recruitment (5/6)
1	2	3	4	5	6	7
15-30	5.94	6.04	16.89	1.00	9	0.111 R1
31-45	4.38	4.79	21.29	0.93	10	0.093 R2
46-60	3.26	3.89	26.22	0.85	10	0.085 R3
61-75	3.03	3.24	31.48	0.95	11	0.086 R4
76 - 90	2.93	2.62	38.93	1.14	12	0.095 R5
91 - 105	2.26	1.96	52.04	1.18	13	0.091 R6
106 - 120	1.61	1.43	71.33	1.15	14	0.082 R7
121 - 135	1.04	1.02	100.00	1.04		
136 & above	0.79	0.79	100.00	0.79		
Total	25.24					
			Stock in hand 1.83			

In the above table by De Liocourt's formula

$$i) \quad r = \frac{a_1 + a_2 + \dots + a_8}{a_2 + a_3 + \dots + a_9}$$

$$= \frac{5.94 + 4.38 + \dots + 1.04}{4.38 + 3.26 + \dots + 0.79}$$

$$= \frac{24.45}{19.30} = 1.27$$

and $S = a_1 + a_2 + \dots + a_9$

$$= 5.94 + 4.38 + \dots + 0.79 = 25.24$$

$$ii) \quad a = \frac{s(rn-1)(r-1)}{(rn-1)}$$

$$= \frac{25.24 \times (6.64) \times (0.27)}{(8.41 - 1)}$$

$$= 45.25 / 7.41$$

$$= 6.04$$

Recruitment in successive three felling series

Felling cycle	Total recruitment
1) 14R7 + 6R6	= 1.152 + 0.543 = 1.695
2) 7R6 + 12R5 + R4	= 0.634 + 1.140 + 0.087 = 1.860
3) 10R4 + 10R3	= 0.867 + 0.854 = 1.721

Realizable recruitment in successive three felling cycles.

a) First Felling Cycle

i) $R_{r1} = \frac{1}{2} \{1.695 - 14 \times (1.695 / 20 - 0.082)\}$
 $= \frac{1}{2} \{1.695 - 14 \times (0.0847 - 0.082)\}$
 $= \frac{1}{2} (1.695 - 0.0378)$
 $= 0.8299$

ii) Available recruitment R_{a1}

$$R_{a1} = 1.695 - 0.8299$$

$$= 0.865$$

b) Second Felling Cycle

i) $R_{r2} = \frac{1}{2} \{1.860 - 7 \times (1.860 / 20 - 0.091)\}$
 $= \frac{1}{2} \{1.860 - 7 \times (0.093 - 0.091)\}$
 $= \frac{1}{2} (1.860 - 0.0175)$
 $= 0.9213$

ii) Available recruitment R_{a2}

$$R_{a2} = 1.860 - 0.9213$$

$$= 0.939$$

c) Third Felling Cycle

i) $R_{r3} = \frac{1}{2} \{1.721 - 10 \times (1.721 / 20 - 0.095)\}$
 $= \frac{1}{2} \{1.721 - 10 \times (0.0861 - 0.095)\}$
 $= \frac{1}{2} (1.721 + 0.0894) = 0.9052$

ii) Available recruitment R_{a3}

$$R_{a3} = 1.721 - 0.9052 = 0.816$$

Table No. 2.8: Net Realisable Recruitment:

Felling Cycle	Total Recruitment	(i) Realisable (ii) Accumulation	Net Realisable Recruitment	Annual average realisable (4/20)	Annual average volume in (cum)
1	1.695	0.830	0.830	0.0415	0.0311
		0.865			
2	1.860	0.921	1.786	0.0893	0.0670
		0.939			
3	1.721	0.905	1.844	0.0922	0.0692
		0.816			

Yield in First Three Felling Cycles:

The existing number of stems per ha above 120 cm girth is 1.83 which will be liquidated in first three cycles. The annual liquidation will be 0.0305 stems/ha or 0.0229 m³/ha. Thus the annual average yield in the first, second and third cycle will be 0.054 m³, 0.0899 m³ and 0.0921 m³ per ha respectively. The total area of the Working Circle is 62561.968 ha. Hence for yield calculation the 62561.968 ha area should be used.

Reserving 50% as the future safeguard, the utilizable yield in three cycles will be 0.027m³, 0.0449 m³ and 0.0460 m³ respectively, and the estimated annual yield for the whole working cycle three cycles will be 1711.70 m³, 2846.500 m³ & 2916.236 m³ respectively.

Yield Calculation for Group-III Species

(Dhaoda, Khair, Rohan, Shiwan, Shisham, Salai, Mowai, Surya) Harvestable girth 90 cms

Table No. 2.9 Yield Calculation for Group-III species

Girth Class	Stem per ha	Stem/ha as per De Licourt's Law	% of survival	Stem/ha reaching harvestable girth [(2x4)/100]	Years required to pass over next girth class	Average annual recruitment (5/6)
15-30	11.65	12.35	17.81	2.08	9	0.231 R1
31-45	11.38	9.78	22.49	2.56	10	0.256 R2
46-60	8.78	7.17	30.68	2.69	11	0.245 R3
61-75	6.29	5.11	43.05	2.71	12	0.226 R4
76 - 90	5.34	3.61	60.94	3.26	18	0.181 R5
91 - 105	2.88	2.20	100.00	2.88	9	0.231 R1
106 - 120	1.66	1.41	100.00	1.66		
121 - 135	0.97	0.97	100.00	0.97		
136 & above	0.75	0.75	100.00	0.75		
Total	49.70					
			Stock in hand 6.26			

In the above table by De Liocourt's formula

$$a_1 + a_2 + \dots + a_8$$

$$i) r = \frac{\dots}{a_2 + a_3 + \dots + a_9}$$

$$a_2 + a_3 + \dots + a_9$$

$$\begin{aligned}
& 11.65 + 11.38 + \text{-----} + 0.97 \\
& = \text{-----} \\
& 11.38 + 8.78 + \text{-----} + 0.75 \\
& 48.95 \\
& = \text{-----} = 1.29 \\
& 38.05
\end{aligned}$$

and S = a1 + a2 + ----- + a9
= 11.65 + 11.38 + ----- + 0.75
= 49.70

ii) $a = s(rn-1)(r-1)/(rn-1)$
= $49.70 \times (7.5)(0.29)/(9.65-1)$
= $108.098 / 8.65 = 12.35$

Recruitment in successive three felling series

Felling Cycle	Total Recruitment
1) $18R5 + 2R4$	= $3.256 + 0.451 = 3.707$
2) $10R4 + 10R3$	= $2.256 + 2.249 = 4.705$
3) $R3 + 10R2 + 9R1$	= $0.245 + 2.561 + 2.075 = 4.881$

Realisable recruitment in successive three felling cycles.

a) First Felling Cycle

i) $R_{r_1} = \frac{1}{2} \times \{3.707 - 18 \times (3.707 / 20 - 0.181)\}$
= $\frac{1}{2} \times \{3.707 - 18 \times (0.1853 - 0.181)\}$
= $\frac{1}{2} \times (3.707 - 0.0954)$
= 1.8132

ii) Available recruitment R_{a1}

$R_{a1} = 3.707 - 1.8132 = 1.894$

Second Felling Cycle

i) $R_{r_2} = \frac{1}{2} \{4.705 - 10 \times (4.705 / 20 - 0.226)\}$
= $\frac{1}{2} (4.705 - 10 \times (0.235 - 0.440))$
= $\frac{1}{2} (4.705 - 0.09) = 2.3039$

ii) Available recruitment R_{a2}

$R_{a2} = 4.705 - 2.3039$
= 2.401

b) Third Felling Cycle

$$\begin{aligned}
 \text{i) } R_{R_3} &= \frac{1}{2} \times \{4.881 - 10 \times (4.881 / 20 - 0.245)\} \\
 &= \frac{1}{2} \times \{4.881 - 10 \times (0.244 - 0.245)\} \\
 &= \frac{1}{2} \times (4.881 + 0.01) \\
 &= 2.4408
 \end{aligned}$$

ii) Available recruitment R_{a_3}

$$R_{a_3} = 4.881 - 2.4408 = 2.440$$

Table No. 2.10: Table Showing Net Realizable Recruitment:

Felling Cycle	Total Recruitment	(i) Realisable (ii)Accumulation	Net Realisable Recruitment	Annual average realisable (4/20)	Annual average volume in cum)
1	3.707	1.8132	1.8132	0.0907	0.0363
		1.8936			
2	4.705	2.3040	4.1976	0.2099	0.0840
		2.4009			
3	4.881	2.4409	4.8418	0.2421	0.0968
		2.4400			

Yield in First three Felling Cycles:

The existing number of stems per ha above 90 cm girth is 6.26 which will be liquidated in first three cycles. The annual liquidation will be 0.104 stems/ha or 0.0417 m³/ha. Thus the annual average yield in the first, second and third cycle will be 0.078 m³, 0.1257 m³ and 0.1385 m³ per ha respectively. The total area of the Working Circle is 62561.968 ha. Hence for yield calculation 62561.968 ha. area should be used.

Reserving 50% as the future safeguard, the utilizable yield in three cycle will be 0.039 m³, 0.0628 m³ and 0.0693 m³ respectively and the estimated annual yield for the whole working cycle three cycles will be 2472.46 m³, 3981.29 m³ & 4393.373 m³ respectively.

Yield Calculation for Group-IV Species (Lendia, Garadi): Harvestable girth 45 cms.

Table No. 2.11: Table Showing Annual Average

31-45	9.34	8.54	57.73	5.39	19	0.284 R2
46-60	5.77	4.93	100.00	5.77		
61-75	3.30	2.70	100.00	3.30		
76 - 90	2.01	1.40	100.00	2.01		
91 - 105	0.77	0.59	100.00	0.77		
106 - 120	0.34	0.28	100.00	0.34		
121 - 135	0.13	0.13	100.00	0.13		
136 & above	0.08	0.08	100.00	0.08		
Total	35.41		Stock in hand 12.40			

In the above table by De Liocourt's formula

$$\begin{aligned}
 & a_1 + a_2 + \dots + a_8 \\
 \text{i) } r &= \frac{a_2 + a_3 + \dots + a_9}{13.67 + 9.34 + \dots + 0.13} \\
 &= \frac{9.34 + 5.77 + \dots + 0.08}{35.33} \\
 &= \frac{21.74}{13.80} = 1.63
 \end{aligned}$$

$$\begin{aligned}
 \text{And } S &= a_1 + a_2 + \dots + a_9 \\
 &= 13.67 + 9.34 + \dots + 0.08 \\
 &= 35.41
 \end{aligned}$$

$$\begin{aligned}
 \text{ii) } a &= s (r-1) (r - 1) / (rn - 1) \\
 &= 35.41 \times (1.63-1) / (79.07 - 1) \\
 &= 1085.30 / 78.07 \\
 &= 13.80
 \end{aligned}$$

Recruitment in successive three felling series

Felling cycle	Total recruitment
1) 19R2 + R1	= 5.393 + 0.349 = 5.742
2) 13R1 + 7R2	= 4.536 + 1.987 = 6.523
3) 12R2 + 8R1	= 3.406 + 2.791 = 6.197

Realizable recruitment in the successive three felling cycles.

a) First Felling Cycle

$$\begin{aligned}
 \text{i) } R_{r1} &= \frac{1}{2} \times \{5.742 - 19 \times (5.742 / 20 - 0.284)\} \\
 &= \frac{1}{2} \times \{5.742 - 19 \times (0.2871 - 0.284)\} \\
 &= \frac{1}{2} \times \{5.742 - 0.0589\} \\
 &= 2.8399
 \end{aligned}$$

ii) Available recruitment Ra1

$$\begin{aligned}
 Ra_1 &= 5.742 - 2.8399 \\
 &= 2.902
 \end{aligned}$$

b) Second Felling Cycle

$$\begin{aligned} \text{i) } R_{r_2} &= \frac{1}{2} \times \{6.523 - 13 \times (6.523 / 20 - 0.349)\} \\ &= \frac{1}{2} \times \{6.523 - 13 \times (0.3261 - 0.349)\} \\ &= \frac{1}{2} \times (6.523 + 0.2977) \\ &= 3.4093 \end{aligned}$$

ii) Available recruitment Ra2

$$Ra_2 = 6.523 - 3.4093 = 3.113$$

c) Third Felling Cycle

$$\begin{aligned} \text{i) } R_{r_3} &= \frac{1}{2} \times \{6.197 - 12 (6.197 / 20 - 0.284) \} \\ &= \frac{1}{2} \times \{6.197 - 12 (0.3099 - 0.284)\} \\ &= \frac{1}{2} \times (6.197 - 0.3108) = 2.9424 \end{aligned}$$

ii) Available recruitment Ra3 = 6.197 – 2.9424 = 3.255

Table No. 2.12: Table Showing Net Realisable Recruitment

Felling Cycle	Total Recruitment	i) Realisable ii) Accumulation	Net Realisable Recruitment	Annual average realizable (4/20)	Annual average volume in m3
1	5.742	2.8399	2.8399	0.1420	0.0089
		2.9018			
2	6.523	3.4093	6.3111	0.3156	0.0198
		3.1132			
3	6.197	2.9424	6.0557	0.3028	0.0190
		3.2548			

Yield in First Three Felling Cycles:

The existing number of stems per ha above 45 cm girth is 12.40 which will be liquidated in first three cycles. The annual liquidation will be 0.207 stems/ha or 0.013 m3/ha. Thus the annual average yield in the first, second and third cycle will be 0.0219 m3, 0.0328 m3 and 0.0320 m3 per ha respectively. The total area of the Working Circle is 62561.968 ha. which will be used for yield calculation.

Reserving 50% as the future safeguard, the utilizable yield in three cycles will be 0.0110 m3, 0.0164 m3 and 0.0160 m3 respectively, and the estimated annual yield for the whole working cycle three cycles will be 697.36 m3, 1039.70 m3 & 1014.34 m3 respectively. The total yield for all four harvesting girth classes will be as under:

Table No. 2.13: Table Showing Total Annual Yield for Three Felling Cycles

Felling Cycle	Per ha annual yield in cum					Annual average estimated yield for SCI WC in m ³
	120 cm (Teak)	120 cm (misc)	90 cm	45 cm	Total	
1	0.0039	0.027	0.039	0.011	0.0809	5128.77
2	0.0059	0.0449	0.068	0.0164	0.1300	8241.54
3	0.0062	0.046	0.0693	0.016	0.1375	8717.01

The above table shows that the yield will be increasing progressively in successive felling cycles provided the crop is protected effectively from various damages.

2.6.8.1 This plan being an extension of previous working plan, no enumeration was carried out during the preparation of plan. Also in previous plan period the total area allotted to SCI was 63396.438 ha. which stands revised to 62561.968 ha. owing to handing over area to Bhandara Forest Division. Only a small portion of the area (ha.) in the coupes allotted under SCI were worked, major portion remains untreated. In this scenario the yield calculation done for previous plan period is adopted to be followed for the current period.

2.6.9: Table of Felling: The abstract of the Table of Felling is given below but the detailed schedule is given in **Appendix No. XXV**.

2.6.10: Method of Executing the Felling:

2.6.10.1: Agency of Harvesting: Demarcation of coupes and marking of trees for felling will be carried out departmentally to meet the silvicultural and technical requirements. Felling of trees, logging and haulage of the felled material, in most of the coupes will be carried out by FLCS and in some coupes it will be done by the Forest department, as per the directives issued by the Government. Silvicultural operations like cut-back operation, cleaning, thinning etc. and other regeneration activities after main felling of the coupes will be carried out under strict supervision of the Forest Department.

The Forest department will examine the legal provisions in the “The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act.2006”, before allotting the coupes to the existing Forest Labour Co-operative Societies. The opinion of the villages should be considered as per the provisions of the Act. JFM committees should also be taken into confidence to encourage the participatory system of forest management.

2.6.10.2: Coupe Demarcation, Preparation of Treatment Maps and Marking Techniques:

Demarcation: The coupe demarcation, preparation of treatment maps and marking will be carried out as per the prescriptions mentioned in the chapter of Miscellaneous Regulations. The main annual coupes shall be demarcated one year in advance along with coupes due for Cleaning and Thinning. The coupe shall be divided into four sections i.e. A, B, C and D, to effectively control the various coupe operations. A particular section will be demarcated only if the area is more than 5 ha.

2.6.10.3: Preparation of Treatment Maps: Treatment maps shall be prepared by the RFO and verified by the ACF. All the treatment type areas shall be shown distinctively on the map along with GPS reading, including the areas suitable for planting, areas having adequate promising natural regeneration and areas prone to soil erosion.

Treatments Proposed for Various Areas:

A-Type Areas: Protection Area

- An area having more than 25° slopes and more than a quarter hectare in extent must be shown on the map as the **A1-type i.e. steep slope**. Smaller areas of steep slope, even if not marked on the map, will also receive the prescribed treatment.
- 20 meter wide buffer along streams will be measured from the bank or the high flood mark. Similar buffer of the **A2-type** areas will be marked along all water bodies and Nallas.
- The **A3-type** areas are excessively erosion prone and include seasonally flooded areas.

Treatments Recommended for A-Type Areas:

- i) Soil and Moisture Conservation:** Gully plugging and other soil and moisture conservation works, as described in the chapter of Miscellaneous Regulations shall be taken in the A3-type areas. Such works may be taken up in the A2-type areas, if not detrimental to the riparian ecosystem.
- ii) Bush Sowing:** Bush sowing of Khair, Neem, Maharukh, Sandal, Babul and other local seeds is prescribed. Any one species should not constitute more than one-fourth of the disseminated seeds.
- iii) Stake Planting:** In the areas around water bodies and along watercourses (A2-type), stakes of Ficus spp., Pangara, Salai or other suitable species will be planted at six-meter interval, and tussocks of Khas grass will be planted on suitable sites, as per Miscellaneous Regulations.

- iv) **Plantation:** Plantation of suitable species may be taken, if necessary and an area not less than 5 ha is available.
- v) **Harvesting Prohibited:** Harvesting of standing trees (dead or alive) is strictly prohibited in the A-type areas. The marketable down logs of valuable species such as Teak, Shisham, Bija, Haldu and Tiwas may be extracted.

B-Type Areas: Under-stocked & Blank Areas: Under stocked areas can be categorised into 2 types:

- **B1-type:** Open forests (density < 0.4) with Natural Regeneration (600 or more saplings per hectare)
- **B2-type:** Open forests (density < 0.4) without Natural Regeneration (saplings less than 600)

Treatments Recommended for B-Type Areas: Preference will be given to natural regeneration and proper treatment will be given to the crop considering the existence of seedlings or rootstock in the areas. Tending of Natural Regeneration of valuable species in the B- type will be carried out as follows:

A. Natural Regeneration Management in B1-type Areas: Following treatments are prescribed for B1-type areas:

- i. **Tending of Natural Regeneration (of seed origin):** All seedlings and saplings (of seed origin) of valuable species, more than 60 cm in height, will be nursed as future crop. Such identified areas should be shown in the treatment map & grid-wise recording of such natural regeneration along with GPS reading should be maintained. Spacing operations, if required, will be carried out to leave nearly 400 saplings per hectare at an average of 5 metre spacing. Spacing out operation will be in favour of valuable species and species rarely found in the area. The natural regeneration shall be assisted and encouraged by soil working and mulching around them, in the following manner.
 - a) **First Year Operations:** Weeds in one-meter diameter around saplings of valuable species should be cleared during the first week of July. Uprooted weed, grasses and leaf-litter should be mixed in the upper layer of soil as the organic mulch and facilitate loosening and aeration of the soil by worms and insects. One soil working should be carried out in October.
 - b) **Second year operations:** The soil working in October will be repeated in the following year. However, one scrap weeding of one-meter diameter should be

carried out in the first week of August around the shoots of seedling coppice within the rootstock management area.

- c) **Third year operations:** Singling of coppice shoots, management of damaged and malformed saplings, climber cutting and shrub clearance should be repeated as third year operations.
- ii) **Singling of Coppice Shoots:** One healthy and promising coppice shoot will be retained on the stumps and the rest will be removed. Such coppice shoots should also be close enough to the ground so that it will not topple after gaining volume and weight and would be able to subsequently develop root system of its own. However, coppice shoots interfering with promising saplings of seed origin or coppice of valuable species shall be removed.
- iii) **Coppice Management of Damaged and Malformed Saplings:** The saplings and poles of up to 45 cm GBH having one third of the stem damaged and malformed shall be coppiced by cutting flush to the ground. Such coppicing, however, should not expose the ground, causing erosion and leading to soil loss. Poles having at least 2.50 meter of clean bole will not be treated as malformed.

B. Artificial Regeneration (Plantations) in B2-Type Areas: Plantations will not be taken up in SCI WC areas unless a minimum of 5 ha of open area, having crown density less than 0.4, is available in an annual coupe. Such suitable sites of the B-type areas may be brought under the plantations. The choice of species will be decided as per the site. Teak and valuable miscellaneous spp. should be given preference in the plantation. Bamboo may be planted depending upon the site. Stump planting of Teak should be taken only in well drained areas with crown density less than 0.2. All planting operations and subsequent operations should follow the guidelines for planting operations described in the chapter of Miscellaneous Regulations.

C. Soil and Moisture Conservation Works: Required soil and moisture conservation works will be carried out as mentioned in the miscellaneous regulations. CCT should only be taken if it is necessary and the estimates are approved by the CCF, Nagpur.

C-Type Areas: Congested Pole Crop: It includes groups of naturally grown poles, having 15 to 45 cm GBH.

Treatments Recommended:-

Thinning: Thinning of congested pole crops will be carried out to maintain an average spacing of one-third of the crop height in such patches. The post-thinning crop should have

basal area and number as close as possible to the relevant stand or yield table for that site quality. Detailed guidelines for thinning have been included in Chapter of Miscellaneous Regulations. Poles of vigorously growing non-Teak species should be preferred for retention if Teak is more than 50 percent of the crop in stocking.

D-Type Areas: Well-Stocked Areas:

Treatments Recommended in D Type Areas

- a. Main felling is concentrated in the areas having density 0.4 or over and showing adequate regeneration of 400 or above established seedlings.
- b. Plantation is not proposed in this area.

The following operations are recommended:

- i. **Enumeration in Annual Coupes:** Species and girth-class of all trees above harvestable girth class and approach class are prescribed to be recorded in 15 cm girth class for enumeration. The enumeration will be carried out in a 100 m X 100 m grid with a base line.
- ii. **Harvesting:** 50% of available matured trees above harvestable girth are prescribed for harvesting. However hollow Teak trees above 75 cm girth are prescribed to be harvested. The harvesting will start from higher girth class to lower girth class. Hollow trees will be harvested first on priority and then other sound Teak trees, subject to their silvicultural availability. The opening created by harvesting are to be regenerated naturally. Well-formed and vigorous seed origin trees will be preferred for retention. To avoid the over felling of valuable species, like Teak, Bija etc., removal of trees will be proportionate to the number of trees of that species found in the coupe.
- iii. **B-Grade Thinning:** If the congestion is expected to persist in some patches after the harvesting, the B-grade thinning in the same girth class will be carried out in such patches. B-grade or moderate thinning is defined as removal of dead, dying, diseased, suppressed, defective dominated stems and whips in this order. Removal of inferior individuals will start from suppressed class and then to some of the dominated class of the crop. Advanced growth having too many branches not desirable to be pruned or lopped, may also be removed.
- iv. **Tending of Natural Regeneration:** Singling and spacing out will be carried out among saplings of Teak and other valuable species listed in the section for the rootstock management. Such identified areas should be shown in the treatment

map & grid-wise recording of such natural regeneration along with GPS reading should be maintained. Spacing operations should leave nearly 400 saplings per ha. The natural regeneration present should be encouraged by soil working and mulching around them in accordance with the guidelines for the rootstock management described in this chapter.

2.6.10.3 Marking Techniques: Marking will be done along with the work of coupe demarcation, one year in advance of the main felling.

Marking technique and prescriptions described in the chapter of the Miscellaneous Regulations shall be followed, with required modifications described in the following paragraphs.

- i. Marking shall be carried out under the close supervision of the RFO and under guidance of ACF concerned. DCF shall himself inspect the coupes to ensure proper marking and to guard against excessive marking, if any.
- ii. The following rules shall be observed strictly for marking in various treatments type areas.

A- Type Areas (Protection Areas): No tree shall be marked for felling.

B-Type Areas (Under Stocked Areas):

1. All dead trees, after retaining 2 dead trees/ha, as snags and dens for nesting and resting of wildlife, shall be marked for felling.
2. All live high stumps shall be marked.
3. All multiple coppice poles; retaining only one, the most promising / stool, shall be marked.
4. All NTFP trees, fruit bearing trees and trees useful for wild life are to be reserved.

C-Type Areas (Groups of Young Poles):

1. The congested pole crop shall be marked for thinning to maintain a spacing equal to 1/3rd of the crop height and/or to bring down stem number as per the yield table.
2. All high stumps, dead poles shall be marked for harvesting.
3. Unwanted undergrowth interfering or likely to interfere, the seed based NR of Teak and other valuable species, shall be removed.
4. All NTFP trees, fruit bearing trees and trees useful for wild life are to be reserved.

D-Type Areas (Well-stocked Areas):

1. All Teak (group I), Ain, Bija, Haldu & Kalam (group II) and the group III & IV (listed species), trees above the harvestable girth and approach class are prescribed to be

enumerated in 15 cm girth-classes, before marking.

2. All hollow Teak trees above 75 cm girth are to be marked for felling. Felling marking is prescribed to proceed from highest girth-class to lower girth-classes; and no trees, except hollow trees, shall be marked for felling unless silviculturally available. Trees of seed origin shall be preferred for retention.
3. All edible fruit bearing species, such as, Mahua, Char, Tendu, Aonla, Sitaphal, Chinch, Bel, Hirda, Beheda etc, NTFP species such as Kullu, Semal, etc. and all trees useful for wild life, shall be reserved against felling.
4. All dead trees, after retaining 2 dead trees per hectare, shall be marked for felling. To avoid excessive felling it is prescribed that malformed trees having straight clear bole exceeding 2.5 metre height from ground level shall not be marked for felling.
5. All live high stumps and all but one vigorously growing coppice pole per stool shall be marked for felling.
6. The marking of Bija, Shisham, Haldu and Tiwas will be done only in the areas where adequate established natural regeneration of these species is found.

Malformed Trees: A tree is malformed when it is defective or abnormal either in crown or bole, which include conditions like, slag headness, crookedness, gnarls, twist or constriction by climbers beyond recoument etc.

Tending of Natural Regeneration: Taking care of the Natural Regeneration, both of seed origin as well as coppice, and nursing them to future healthy matured crop. This operation includes: CBO, Singling of coppice on the stump, spacing out of young saplings, de-budding & branch cutting of saplings, cleaning & soil working for natural seedlings of desired species. It does not include the silvicultural thinning of old plantations as well as clearing of bushes in the coupe. Such identified areas having sufficient regeneration of valuable species should be shown in the treatment map & grid-wise recording of such natural regeneration along with GPS reading should be maintained.

2.6.11: Subsidiary Silvicultural Operations:

Cutback Operations: Cutback operations shall be carried out, in the next year of coupe working in the annual coupes. (**Appendix No. XXIV**) All the left over marked trees during the main coupe operations shall be removed. Such trees, if less than 2 percent of original marking, can be felled after inspection of the Range Forest Officer. Deputy Conservator of Forests may sanction felling up to 5 percent of the original marking, and a higher proportion would require prior permission of the Chief Conservator of Forests (Territorial), Nagpur. All trees damaged during the main coupe felling shall be marked for removal as well as multiple

coppice shoots and poles shall be reduced to one per stool so as to serve as future crop. All newly risen coppice shoots of valuable species shall be removed to encourage establishment of seedling regeneration for future crop.

Recording of such areas should be made in the treatment map along with GPS reading.

2.6.11.1 Cleaning - Cleaning in the 6th year from the main felling will be done. Treatment map of the coupe of proposed work of cleaning should be prepared by RFO & GPS reading of the same should be recorded. The same should be verified after field inspection by ACF. All areas of the natural regeneration, tending, rootstock management and plantations shall be recorded in the divisional notebook and shall be cleaned. Unwanted undergrowth interfering or likely to interfere with the growth of NR of Teak and other valuable species shall be cut to facilitate the existing crop. Coppicing of damaged and malformed saplings and singling of coppice shoots shall be carried out to keep most promising coppice shoot. All newly risen Teak coppice shoots shall be removed. Established seedling regeneration of Teak and other miscellaneous species shall be spaced out suitably. Spacing of dense growth will follow the stand table of the concerned species. In absence of the stand table, thumb-rule of keeping the spacing at one-third of the average height will be followed.

2.6.11.2 Thinning - Thinning is prescribed in the 11th year of main felling in teak plantation. It will be carried out in patches of dense pole crop by maintaining average spacing of one-third of the crop height. The post-thinning crop should have basal area and number as close to the relevant stand or yield table for that site quality. Thinning guidelines given in the letter by MD, FDCM vide letter no. pln/05/F-4/2874, dated 02/09/1999 and PLN/05/F-4/ 5388, dated 02/02/2006 may be referred from Maharashtra Forest Records No. III Silviculture Book.

2.6.12: Regeneration:

- Tending of Natural Regeneration, including rootstock management, is prescribed to be given preference over plantations. The areas with promising seedling of seed origin and rootstock patches shall be identified and marked on the treatment map along with GPS reading. The treatment, as prescribed above, shall be given to such areas. Tending operations as prescribed for natural regeneration in the B-type areas will be taken up with the coupe operations.
- Plantations shall be taken only in the B-type and A-type areas, (except natural blanks) having inadequate NR in a patch of a minimum of 5 ha area. For plantations, Plantation Guidelines shall be followed.

- Bamboo plantations shall be taken in suitable areas in such a way that it does not suppress the valuable light demanding species like Teak.
- Stump planting of Teak should only be taken in the areas with well drained soil and crown density less than 0.2. The remaining plantation area will be brought under the mixed species plantations using suitable species like Shiwan, Shisham, Bija, Khair, Mahrukh, Kinhi, Semal, Sisso, Babul and fruit trees (Ficus species, Ber etc for wildlife).

2.6.13 Associated Regulations and Measures:

2.6.13.1 Soil and Moisture Conservation:

The soil and moisture conservation works will be taken up along with marking operation and completed before on set of monsoon in the next financial year. The soil and moisture conservation works will include gully plugging and nala bunding etc. These works will be taken up after preparation of a detailed treatment map of the area and model of soil and moisture conservation measures duly sanctioned by the competent authority. As breaking of soil is not advisable in the forest, Continuous Contour Trenches/ Staggered Contour Trenches should be taken only if it is necessary. The estimates of these trenches should be examined and approved by the Chief Conservator of forests, Territorial, Nagpur.

2.6.13.2 Choice of Species:

Since Teak is the most valuable species and comes above all the miscellaneous timber species; it will be given top priority, wherever present. The miscellaneous species to be favoured in the existing crop, in order of their priorities, are Bija, Saja, Shisham, Tinsa, Kalam, Haldu, Kasai, Dhaoda, Bhirra, Rohan, Lendia, Garadi and Mowai. However, in inferior areas with degraded soil, Rohan, Bhirra, Khair, Garadi and Lendia will be preferred. In the artificial regeneration Teak will be planted in open areas with well drained soil, and Khair and Rohan will be planted in inferior areas. Bamboo will be planted in all suitable soils but due precaution should be taken so that it should not suppress other valuable species. Besides this, edible fruit and flower yielding plants will be reserved from felling and will also be planted along with the timber species. In the plantation some shade bearing fruit trees like Ficus spp, Ber etc will also be planted for the benefit of wildlife. Some important MFP yielding species, like Kullu, Char, Mahua etc or as desired by the villagers, may also be planted to benefit the local population.

2.6.13.3 JFM Activities:

Forest conservation necessitated active participation of local communities. The National Forest Policy, 1988 accordingly provided for creating a massive people who suffer the most as a result of forest degradation. The National Forest Policy, 1988 emphasized that domestic requirements of the tribal and other poor people living within and near the forest for fuel wood, fodder, NTFP and construction timber should be the first charge on forest produce and the holders of customary rights and concession in forest areas should be motivated to identify themselves with the protection and development of forest from which they derive benefits. In pursuance to the National Forest Policy 1988, the Ministry of Environment and Forests decided to ask the State Governments to adopt the JFM system for the protection and rehabilitation of degraded forest. The Government of Maharashtra Resolution No.SIF-1091/199/F-11, dated 16th March 1992 JFM approach was adopted for degraded forest areas of this state. These guidelines were modified vide G. R. No. MSC/2000/C. No. 143/F-2, dated 25/4/2003. Recently Revenue & Forest Department has issued consolidated G.R. No. FDM-2011/CR-100/F-2, dated 5th October 2011, No. FDM-2011/CR-104/F-2, dated 25th October 2011, FDM-2011/CR-100/F-2, dated 22nd December 2011 & FDM-2012/CR-4/F-2, dated 10th July 2012, which should be strictly followed by DCF Gondia while implementing JFM scheme in Gondia Division.

Protection from fire and grazing is essential for the success of natural and artificial regeneration. All annual coupes shall remain closed to grazing; and shall be provided strict fire protection, till completion of the 6th year coupe cleaning operations.

CHAPTER 3

IMPROVEMENT WORKING CIRCLE

3.1: IMPROVEMENT WORKING CIRCLE: The area of this Working Circle has been clearly marked on the GIS based map of 1:50000 and a copy of the same is given on a smaller scale on A4 size here.

3.2: GENERAL CONSTITUTION OF THE WORKING CIRCLE

Forest areas capable of producing medium to large-sized timber, poles and fuel wood but not considered fit for harvesting due to preponderance of young crop has been included in this working circle. The Improvement Working Circle (IWC) covers an area of 22648.129 ha comprising 13226.020 ha of Reserved Forests and 8971.451 ha of Protected Forests & 450.658 ha of un-classed forest. It constitutes 13.410 % of the total forest area of the division.

It includes a bulk of forests under old Coppice With Reserve and Improvement Working Circles of older working plans. It also includes areas of successfully converted crop under the Conversion Working Circle during earlier plans. This working circle is expected to serve as transition to SCI working circle. Forests capable of producing large-sized timber but not considered fit for harvesting, are included in this working circle. It includes forests that need rest for sometime, the pole crop and old the teak plantations.

Based on the results of Enumeration data, satellite imageries and existing stock map details, following criteria has been considered for allocation of compartments to the Improvement Working Circle.

1. Areas with young crop and damaged crop, requiring spacing out (thinning) and improvement felling to develop it as future SCI crop.
2. Majority of old IWC Working Circle (CWR Working Circle areas of old working plans) in the previous plans with young and pole crops are included.
3. Some Compartments of SCI working circle and Miscellaneous working circle of the previous plans, have been found suitable for IWC, have been included in this Working Circle.
4. Compartments should have dense forests more than forest blanks and have at least 5 sqm per ha of basal area.

The Range-wise distribution of area under this Working Circle is given in table below:

Table No. 3.1

S. N	Name of the Range	RF		PF		Unclassed Forest (Total Comptt.)	Unclassed Forest Area (in ha)	Total Comptt.	Total (in.ha.)
		No. of Comptt.	Area in Ha.	No. of Comptt	Area in Ha.				
1	Tiroda	3	952.706	19	2055.317	0	0	22	3008.023
2	Gondia	0	0	2	140.400	0	0	2	140.400
3	Goregaon	2	290.000	5	1022.220	0	0	7	1312.220
4	Amgaon	3	439.456	2	369.200	0	0	5	808.656
5	Salekasa	6	1102.100	8	1061.455	0	0	14	2163.555
6	North Deori	7	1526.220	15	1955.095	0	0	22	3481.315
7	South Deori	8	1252.508	2	587.106	0	0	10	1839.606
8	Chichgarh	3	564.200	5	723.874	0	0	8	1288.074
9	SadakArjuni	1	344.944	2	618.610	1	307.399	4	1270.953
10	Nawegaon bandh	7	1915.080	1	107.440	0	0	8	2022.520
11	Ghothangaon	14	2735.510	2	215.111	1	143.259	17	3093.880
12	Arjuni Morgaon	18	2173.560	2	45.367	0	0	20	2218.927
Total		72	13296.284	65	8901.195	2	450.658	139	22648.129

3.3: GENERAL CHARACTERISTICS OF THE VEGETATION

The forest area allotted to this working circle vary considerably in composition, density and growth. On the basis of enumeration results, the species composition and their girth distribution in forest areas under this working circle, is given below in Table No. 3.2

Table No. 3.2: Species and Girth- wise Distribution in IWC Area

Species	g15 30	g31 45	g46 60	g61 75	g76 90	g91 105	g106 120	g121 135	g136 150	g151 up	Total	Basal Area (m ²)
Ain	2.069	1.304	0.750	0.464	0.328	0.156	0.088	0.037	0.020	0.016	5.232	0.108
Aonla	0.118	0.112	0.067	0.077	0.036	0.014	0.005	0.001	0.000	0.000	0.430	0.010
Behada	0.097	0.053	0.036	0.033	0.029	0.019	0.012	0.005	0.008	0.013	0.307	0.012
Bel	0.060	0.073	0.025	0.024	0.010	0.019	0.000	0.000	0.000	0.000	0.209	0.004
Bhirra	0.706	0.463	0.214	0.103	0.055	0.027	0.013	0.009	0.001	0.001	1.592	0.025
Biba	0.105	0.072	0.055	0.024	0.010	0.001	0.000	0.004	0.002	0.000	0.273	0.005
Bija	0.504	0.335	0.303	0.265	0.262	0.155	0.107	0.065	0.031	0.052	2.081	0.084
Bor/Ber	0.006	0.018	0.002	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.027	0.000
Char	0.968	0.474	0.215	0.122	0.044	0.024	0.004	0.000	0.001	0.000	1.852	0.024
Chichwa	0.060	0.104	0.141	0.140	0.092	0.031	0.027	0.005	0.002	0.008	0.611	0.023
Dhaman	0.095	0.098	0.066	0.043	0.016	0.004	0.006	0.000	0.000	0.000	0.329	0.006
Dhawada	1.411	0.879	0.533	0.279	0.194	0.108	0.046	0.022	0.012	0.007	3.491	0.068
Garadi	2.662	1.866	0.973	0.425	0.148	0.045	0.010	0.003	0.002	0.001	6.133	0.083
Haldu	0.044	0.023	0.018	0.020	0.025	0.005	0.008	0.002	0.000	0.009	0.154	0.006
Hirda	0.102	0.043	0.033	0.008	0.011	0.015	0.014	0.007	0.005	0.013	0.252	0.009
Kalam	0.027	0.038	0.031	0.027	0.017	0.023	0.016	0.004	0.003	0.004	0.190	0.008
Kasai	0.155	0.138	0.083	0.079	0.033	0.018	0.007	0.006	0.001	0.003	0.523	0.012
Khair	0.147	0.118	0.114	0.064	0.028	0.004	0.001	0.000	0.000	0.000	0.476	0.009
Kulu	0.003	0.010	0.000	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.016	0.000
Lendia	2.226	0.893	0.326	0.226	0.113	0.029	0.013	0.004	0.003	0.002	3.835	0.046
Moha	0.660	0.274	0.189	0.129	0.097	0.090	0.060	0.037	0.051	0.114	1.701	0.069
Mokha	0.012	0.014	0.031	0.019	0.017	0.008	0.003	0.001	0.001	0.001	0.106	0.004
Mowai	0.313	0.329	0.327	0.207	0.166	0.071	0.039	0.025	0.015	0.006	1.498	0.045
Other	2.97	1.80	1.14	0.71	0.43	0.18	0.11	0.06	0.02	0.08	7.49	0.16
Palas	0.501	0.314	0.188	0.093	0.098	0.033	0.005	0.004	0.005	0.000	1.243	0.023
Rohan	0.426	0.288	0.192	0.111	0.061	0.019	0.010	0.008	0.000	0.000	1.116	0.020
Salai	0.035	0.054	0.059	0.070	0.067	0.045	0.025	0.015	0.008	0.008	0.386	0.019
Semal	0.028	0.017	0.028	0.014	0.019	0.015	0.013	0.005	0.002	0.001	0.142	0.006
Shisham	0.021	0.040	0.065	0.042	0.010	0.000	0.000	0.000	0.000	0.000	0.178	0.004
Shiwan	0.031	0.050	0.005	0.002	0.000	0.000	0.002	0.000	0.000	0.000	0.089	0.001
Surya	0.313	0.437	0.342	0.221	0.099	0.030	0.004	0.002	0.000	0.001	1.449	0.031

Teak	2.526	1.748	0.533	0.213	0.109	0.080	0.053	0.026	0.006	0.010	5.306	0.074
Tendu	0.874	0.223	0.083	0.036	0.024	0.022	0.010	0.004	0.005	0.005	1.285	0.016
Tiwas	0.064	0.038	0.010	0.008	0.015	0.006	0.010	0.000	0.003	0.000	0.153	0.004
Total	20.339	12.743	7.177	4.293	2.664	1.295	0.721	0.367	0.207	0.351	50.157	1.019

The crop consists mainly of mixed miscellaneous species with scattered teak. The prominent species are *Saja, Moha, Bija, Garadi, Dhaora, Teak, Lendia, Mowai, Salai, Tendu, Rohan, Char, Kasai, Bhirra, Khair, Hirda, Beheda, Semal, Surya and Aonla*. Natural as well as planted bamboo occurs in a few compartments. Though the proportion of teak is small, the areas are potentially suitable for teak forests. Natural regeneration of common species is present, but its establishment varies, depending upon fire and grazing damage.

The site quality ranges from III to IVb. The density of forests varies from 0.4 to 0.6. The crop is young to middle aged with occasional mature trees. Stems in lower girth classes are proportionately higher in number. Forests adjoining to villages are subjected to constant hacking for fuel-wood, specially in PFs. All the growths in such areas have become bushy, including the superior miscellaneous species, except in some protected forest where hardy species like Teak is abundantly present. The miscellaneous species are *Saja, Dhaoda, Garadi, Bhirra, Rohan, Bija, Lendia, Kalam, Khair and Haldu*. The understorey consists of *Garadi, Kuda and Dicamali*. The fruit species are *Aonla, Char, Moha, Sitaphal, Bel, Tendu* etc. In the well stocked areas very less grass comes up. In under-stocked areas *Kusal, Ghonad, Marvel, Paunia and Mushan* grasses come up. The natural regeneration of almost all species is seen. But due to heavy grazing pressure, annual fires and desiccation it does not get established. *Garadi and Lendia* are very good coppicers, but their coppice shoots are cut annually for fencing material and fuel wood. In some compartments Bamboo have been planted, which are successful in many areas, but need cleaning operations. In the areas, near villages, where grazing pressure is high, the ground flora and regenerations, including plantations, are destroyed and the soil has become compact. The crop is also damaged due to pressure of firewood. Soil erosion has started at many places. The miscellaneous species found are *Bija, Saja, Bhirra, Dhaoda, Surya, Kalam, Garadi and Lendia*.

Among the fruit trees *char, Aonla, Moha and Bel* have come up. The undergrowth consists of *Kuda and Decamali*.

3.4: FELLING SERIES, CUTTING SECTIONS AND JFM AREAS: The entire area of this working circle is divided into 12 felling series with an average area of 1664.93. ha. The area of each treatment series is further divided into 20 coupes with average coupe area as 83.24 ha. (**Appendix No.XXVIII**)

3.5: BLOCKS, COMPARTMENTS AND JFM AREA: The entire working circle comprises of 147 compartments, including 88 compartments of RF, 57 compartments of PF and 2 compartment of unclassified forests. (**Appendix No. XXVI**)

3.6: SPECIAL OBJECTIVES OF MANAGEMENT:

The special objectives of management of the constitution of for this working circle are:

1. To improve the quality and productivity of the existing crops by improvement felling, tending operations in favour of valuable species and supplementary plantations, all these measures are aimed at nursing back these forests to normalcy.
2. To check soil erosion and conserve soil moisture, essential for creating conditions conducive for rejuvenation and growth of natural regeneration and rootstock.
3. To meet the bona fide needs of the local people by carrying out the hygienic tending and thinning operations, expected to provide small timber, poles and firewood.
4. To conserve the biological diversity of the area.

3.6.1: ANALYSIS OF THE CROP:

Stock Mapping: The conventional stock mapping has been carried out by the field staff of Gondia Division.

Age and Density: The crop is mostly young to middle aged with scattered matured trees having crop density of around 0.4, but in some patches with dense pole crop the density is up to 0.6 or even more,

Site Quality: Site quality governs the harvestable girth. Harvesting is not the main objective, but the harvestable girth will be used for patches where the density of matured trees is good. However, site quality does not change much in time span of 20 years and hence the information from the previous plan has been used to delineate and digitise the various site quality classes.

Enumeration: Enumeration was carried out during the previous plan period in 480 plots in over an area of 22727.188 ha. Inventory work included complete enumeration of species and girth distribution of all trees, regeneration, and recording of the site quality and density. Analysis of the data collected from these sample plots is given in **Appendix No. XX**. This data was used for the relative distribution of species, girth-wise, basal area wise, which ultimately is used for allocation of working circles.

Regeneration: Average numbers of seedlings and saplings per ha in the IWC areas are found out from regeneration survey, which are not satisfactory, because of uncontrolled grazing & fire.

3.6.2: Silvicultural System: The good quality dense forests having young to middle aged crop are aimed at to mature as future productive selection forests, if hygienic operations of improvement felling are carried out and adequate growing space is provided to the trees of valuable species, like Teak, Bija, Chichwa, Haldu, Kasai, Kullu, Mokha, Semal, Shisham, Shiwan, Tiwas, Beheda etc. The species whose population in the 'stand' dynamics is less than 1% shall be retained till they reach the rotation age. Supplementary plantations of suitable species in open forests and forest blanks would result in improvement of stocking. The best suited system of treatment is improvement felling supplemented by tending of naturally regenerated crop and rootstock. The future crop has been visualized to have mixed composition of valuable species like Teak, and other superior miscellaneous species.

3.6.3: Rotation Period : No rotation is fixed as the basic object of management is to improve the growing stock by tending of recruitment, thinning in the whole plantations, removal of dead and diseased trees and taking of plantations to improve the composition.

3.6.4: Harvestable Diameter: This working circle aims at improvement of the crop, and therefore, harvesting is not visualised in the area. However, for the purpose of managing a few dense patches of over-matured trees the harvestable girth adopted for the SCI working circle areas will be applied for this working circle. However, in this working circle no commercial felling except for improvement felling, shall be carried out. This will also lead to opening of canopy to some extent resulting in regeneration of light demander species.

3.6.5: Reducing Factors and Reduced Areas: Not applicable.

3.6.6: Felling Cycle: The entire area in this working circle is proposed to be covered for prescribed treatment in 20 (twenty) years. Thus the felling cycle is fixed at 20 (twenty) years. In this working plan coupe no. XI of previous plan is treated as coupe no. I and sequence to be followed.

3.6.7: Division into Periods and Allotment to Periodic Block (Pb):

Not applicable, as the silvicultural system applied is for improvement, there is no division into period or any Periodic Block.

3.6.8: Calculation of Yield

Regulation of yield: Since harvesting is not prescribed, yield regulation is not described. The silvicultural tending operations will be regulated by area.

3.6.9: Table of Felling: The abstract of the Table of Felling is given below but the detailed schedule is given in **Appendix No. No. XXVIII**.

3.6.10: Method of the Executing Felling

Agency for Harvesting: Demarcation of coupes and marking of trees for felling will be carried out departmentally to meet the silvicultural and technical requirements. felling of trees, logging and haulage of the felled material may be allotted to the FLCs or JMFCs of the villages or as decided by the competent authority under the provisions of “The Scheduled Tribes And Other Traditional Forest Dwellers (Recognition Of Rights) Act 2006”, provided the coupe has sufficient material to be extracted. Strict supervision of the forest department should be kept on the working of the harvesting agencies, so that all the prescriptions are implemented properly. Some coupes will be worked departmentally, as per the directives issued by the government. Silvicultural operations like cut-back operation, cleaning, thinning etc. and other regeneration activities after main felling of the coupes will be done departmentally.

3.6.10.1 Coupe Demarcation, Treatment Maps

Demarcation: The demarcation of annual coupes shall be carried out one year in advance of main working along with the coupes due for cleaning and thinning, as per the prescriptions given in the Chapter of Miscellaneous Regulations.

Preparation of Treatment Map: Treatment Maps shall be prepared by the RFO and verified by the ACF. All the treatment type areas i.e. A-Type, B-Type, C-Type and D-Type areas and their sub-classes shall be shown distinctively on the map along with GPS reading. This shall include the areas suitable for planting and areas having adequate promising NR and rootstock.

Treatment Prescribed:- Treatment proposed in various treatment type areas marked on the treatment map shall be taken as under.

A-Type Areas (Protection Areas):

They will include:

A1- Type areas, which have slope more than 25°.

A2-Type areas i.e. 20 m wide strip on both sides of streams.

A3-Type areas, areas susceptible to excessive erosion.

Following Treatments are recommended:

1. Soil and moisture conservation works/measures, as prescribed in the Chapter of Miscellaneous Regulations.
2. Suitable species should be planted if the area is more than 5 ha and poor and in natural regeneration.
3. No harvesting is prescribed in these areas, except down logs of valuable spp.

B-Type Areas (Under-Stocked Areas): Open and degraded areas with density less than 0.4 are included.

B1-Type areas are with sufficient Natural Regeneration (400 or more seedlings/ha.)

B2-Type Areas are with insufficient Natural Regeneration (<400 Seedlings/ha.)

Following Treatments are recommended:

1. Soil and moisture conservation works/measures will be carried out in B-Type areas, as prescribed in the Chapter of Miscellaneous Regulations.
2. In the B1-Type areas, tending of Natural Regeneration will be carried out in favour of valuable and desirable species. The seedlings of seed origin shall be given preference over coppice.
3. B2-Type areas shall be regenerated with the help of Artificial Regeneration and in the process, Teak, suitable miscellaneous (including NTFP and Ficus) species and

Bamboo shall be planted in conformity with the Ecological Index and the Plantation Guidelines given in the Miscellaneous Regulation.

C-Type Areas (Congested Pole Crop): Areas with sufficient pole crop of valuable species which can be retained as future crop are included in this type of areas.

Following Treatments are recommended:

1. No planting shall be done in these areas.
2. Thinning shall be carried out in young pole crop with thumb rule of 1/3rd spacing out of the crop height.
3. The field staff should be trained and encouraged to use the local yield table for the purpose of thinning and to bring the numbers and spacing, matching with the yield table, as prescribed under the Thinning Guidelines.

D-Type Areas: Well-stocked Areas: Areas having density of 0.4 or over, showing adequate regeneration, 400 or above established seedlings are considered as well stocked areas and have been included in D-Type area.

Following Treatments are recommended:

1. **Enumeration in Annual Coupes:** Trees suitable for removal will be enumerated and listed.
2. **Marking for Harvesting:** Trees for improvement felling in favour of valuable species and over matured trees in few dense patches (above harvestable girth as prescribed in SCI WC) are marked for felling. Well-formed and vigorous trees of valuable timber and NTFP species will be preferred for retention.
3. **Cutback Operations:** The cutback operations shall be carried out in the year following harvesting of mature trees, if any, trees damaged during harvesting and all live stumps shall be removed by cutting it to the ground.
4. **No Commercial Felling:** However, in this working circle no commercial felling except for improvement felling shall be carried out.
5. **No Plantation is recommended.**

3.6.10.2 Marking Rules:- Marking technique and prescription described in the chapter of Miscellaneous Regulations shall be followed. Marking shall be carried out under the close supervision of RFO and under the guidance of ACF concerned. DCF shall himself inspect majority of coupes to ensure proper marking and to guard against wrong marking, if any.

The following rules are proposed to be observed strictly for marking in various treatments type areas;

A-Type Areas: Protection Areas: No tree shall be marked for felling.

B-Type Areas: Under Stocked Areas:

1. All dead trees, after retaining 2 dead trees / ha, as snags and dens, for nesting and resting of wildlife.
2. All live high stumps shall be marked.
3. All multiple coppice poles; retaining only one, the most promising/ stool, shall be marked.

C-Type Areas: Groups of Young Pole Crop:

1. The congested pole crop shall be marked for thinning to maintain a spacing equal to 1/3rd of the crop height and/or to bring down stem number as per the yield table.
2. Unwanted undergrowth interfering or likely to interfere the seed based NR of Teak and other valuable species shall be removed.

D- Type Areas: Well-stocked Areas:

1. All over-matured Teak, Ain, Bija and Dhaoda trees if any, are to be enumerated in 15 cm girth-classes, before marking.
2. All healthy edible fruit bearing species, such as, Moha, Char, Tendu, Aonla, Sitaphal, Chinch, Bel, Hirda, Beheda and NTFP yielding species like, Kullu, Semal etc. shall be reserved.
3. All dead trees, after retaining 2 dead trees per hectare and all live high stumps shall be marked for felling.
4. Mature trees that have developed hollowness and show visual sign of decay will be marked for felling if, silviculturally, available.
5. All, but one, vigorously, growing coppice pole per stool shall be marked for felling.
6. However, in this working circle no commercial felling except for improvement felling, shall be carried out.

3.6.11 Subsidiary Silvicultural Operations Cleaning and Thinning:

3.6.11.1 Cutback Operation: The cutback operations will be carried out in the next year of coupe working (**Appendix No. XXVII**). All trees damaged during the harvesting of mature trees shall be removed. All left over multiple coppice shoots and poles shall be reduced to one per stool. The objective is to facilitate the most vigorous coppice shoot to become future crop. All newly risen coppice shoots shall be removed to encourage establishment of seedling regeneration. Such trees, if less than 2 percent of original marking, can be felled after inspection of the Range Forest Officer. Deputy Conservator of Forests may sanction felling up to 5 percent of the original marking, and a higher proportion would require prior permission of the Chief Conservator of Forests (Territorial), Nagpur. All trees damaged during the main coupe felling shall be marked for removal as well as multiple coppice shoots and poles shall be reduced to one per stool so as to serve as future crop. All newly risen coppice shoots of valuable species shall be removed to encourage establishment of seedling regeneration for future crop. Recording of such areas should be made in the treatment map along with GPS reading.

3.6.11.2 Cleaning in the sixth year: Cleaning in the 6th year from the main felling will be done. Treatment map of the coupe of proposed work of cleaning should be prepared by RFO & GPS reading of the same should be recorded. The same should be verified after field inspection by ACF. All areas of the natural regeneration, tending, rootstock management and plantations shall be recorded in the divisional notebook and shall be cleaned. All inferior species including the unwanted undergrowth interfering or likely to interfere with the growth of teak and other valuable species shall be cut. Unwanted undergrowth interfering or likely to interfere with the growth of NR of Teak and other valuable species shall be cut to facilitate the existing crop. Coppicing of damaged and malformed saplings and singling of coppice shoots shall be carried out to keep most promising coppice shoot.

All newly risen Teak coppice shoots shall be removed. Established seedling regeneration of Teak and other miscellaneous species shall be spaced out suitably. Spacing of dense growth will follow the stand table of the concerned species. In absence of the stand table, thumb-rule of keeping the spacing at one-third of the average height will be followed.

3.6.11.3 Thinning in 11th. Year: Thinning is prescribed to be carried in the worked coupe in the 11th year of coupe working as per thinning guidelines. This will reduce the congestion in the young crop. Poles of vigorously growing non-Teak species should be preferred for retention so long as not less than 50 percent of the crop is dominated by Teak. It will be carried out in patches of dense pole crop by maintaining average spacing of one-third of the crop height. The post-thinning crop should have basal area and number as close to the relevant stand or yield table for that site quality. Poles of vigorously growing non-Teak species should be preferred for retention so long as not less than 50 percent of the crop is dominated by Teak. Thinning guidelines given in the letter by MD, FDCM vide letter no. pln/05/F-4/2874, dated 02/09/1999 and PLN/05/F-4/ 5388, dated 02/02/2006 may be referred from Maharashtra Forest Records No. III Silviculture Book.

3.6.12 Regeneration: All open and blank areas (except natural blanks) will be regenerated either by tending and nursing the existing Natural regeneration and if it is not possible, shall be regenerated artificially. In both the methods the treatment maps and execution on the ground will be based on 50 m X 50 m grids with proper reference points.

3.6.12.1 Choice of Species: The species in the existing growth to be favoured, in order of their priorities i.e. Teak, Bija, Shisham, Haldu, Saja, Tiwas, Garadi, Lendia, Dhaoda, Kalam, Rohan and Bhirra. In the understorey Kuda and Dikamali will be preferred as they are very

good fuel wood. Edible fruit and flower yielding trees in general, are to be reserved every where. Same sequence of priority will be maintained in the tending of natural regeneration. In the artificial regeneration, besides planting of above species Khair, Kinhi, Babul, Neem and Shiwan will be planted. Though Kinhi, Neem and Babul are not forestry species, they are suitable for planting in the forest as these species are now increasingly being used by the villagers. Some shade and fruit bearing trees like ficus spp. etc. will also be planted for the benefit of wildlife.

3.6.12.2 Natural Regeneration:

1. Natural Regeneration of seed origin of valuable shall be given preference over the plantations. The existing NR, including rootstock, shall be tended as per the prescriptions for NR management in SCI working circle. Plantations shall be taken as a supplementary activity to NR in the under stocked areas. Such identified areas should be shown in the treatment map & grid- wise recording of such natural regeneration along with GPS reading should be maintained.
2. Tending operations for natural regeneration in the B1-type shall be taken up along with the coupe operations. Clearing of bushes should not be understood as tending of natural regeneration.
 - i. **Singling of Coppice Shoots:** One healthy and promising coppice shoot will be retained on the stumps and the rest be removed to serve as a future crop. This will facilitate the growth of most promising crop. Coppice shoots interfering with promising saplings of seed origin should be removed. Such coppice shoots should also be close enough to the ground so that it would not topple after gaining volume and weight and would be able to develop root system of its own subsequently. Such areas should be demarcated in the field with grid-wise recording of GPS reading should be recorded. Grid-wise recording of all species where tending operation has been done should be done.
 - ii. **Coppice Management of Damaged and Malformed Saplings:** The saplings and poles of up to 45 cm GBH having one third of the stem damaged and malformed shall be coppiced by cutting flush to the ground. Such coppicing, however, should not expose the ground and cause erosion and lead to soil loss. Poles having at least 2.50 meter of clean bole will not be treated as malformed.
 - iii. **Tending of Natural Regeneration of Seed Origin:** All seedlings and saplings of seed origin shall be given preference over the coppice. Saplings of valuable

species, more than 60 centimetres in height will be nursed as future crop. Spacing operations, if required, will be carried out to leave nearly 400 saplings per hectare at an average of 5 metre spacing. The natural regeneration shall be assisted and encouraged by soil working and mulching around them, in the following manner.

3.6.12.3 First year operations: Weeds in one-meter diameter around saplings of valuable species shall be cleared during the first week of July. Uprooted weed, grasses and leaf-litter shall be mixed in the upper layer of soil as the organic mulch and facilitate loosening and aeration of the soil by worms and insects. One soil working shall be carried out in October.

3.6.12.4 Second year operations: The soil working in October will be repeated in the following year. However, one scrape weeding of one-meter diameter shall be carried out in the first week of August around the shoots of coppice seedlings.

3.6.12.5 Third year operations: Singling of coppice shoots, management of damaged and malformed saplings, climber cutting and shrub clearance shall be done.

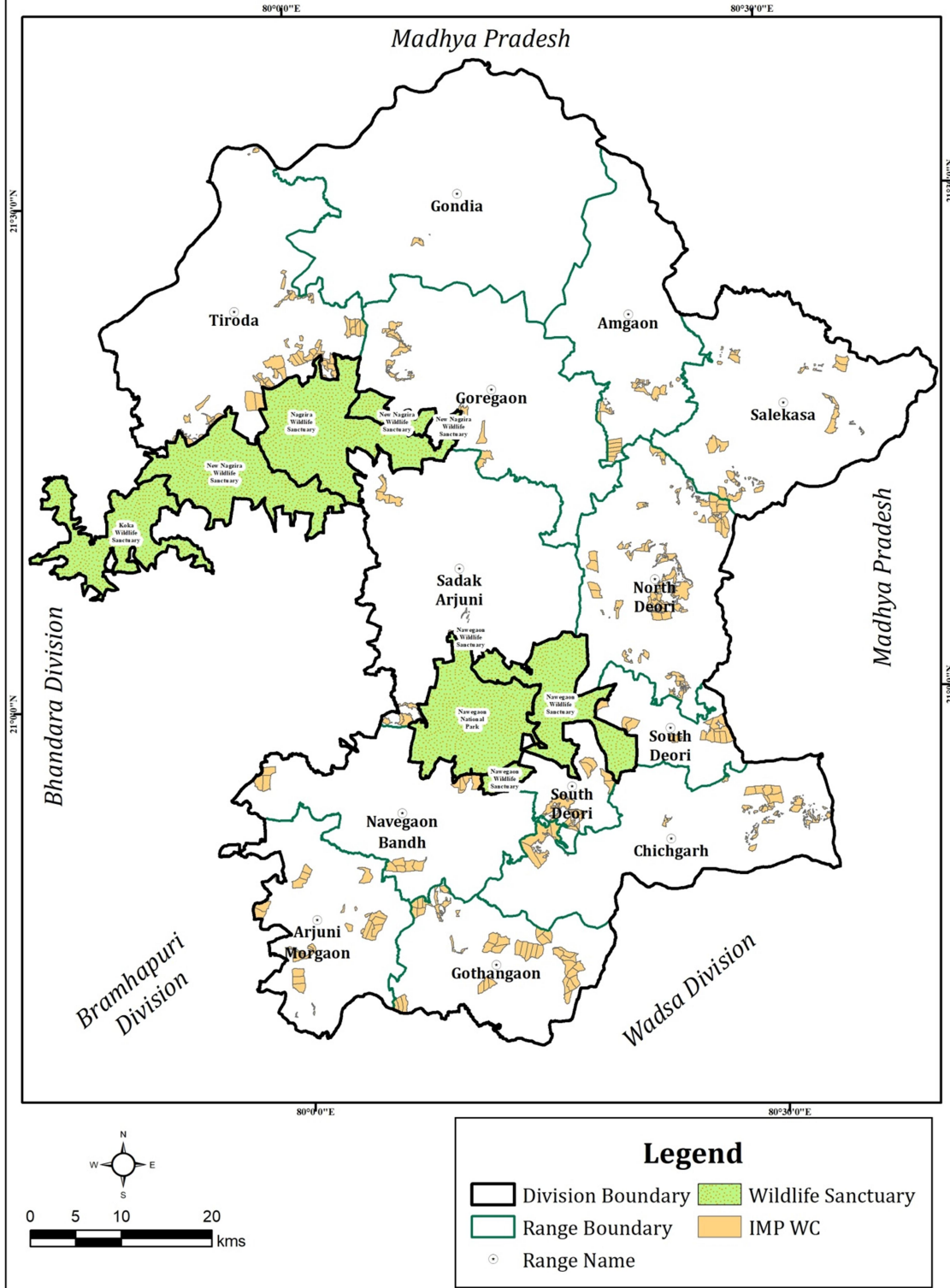
3.6.12.6 Artificial Regeneration: Plantations in the B2-type and A-type areas are prescribed as per the plantation guidelines given in the Miscellaneous Rules. Preference will be given to the local valuable species and as desired by the local people. Areas suitable for Bamboo will be brought under the Bamboo plantations but reasonable care should be taken while taking Bamboo plantation, so that it should not suppress the young crop of valuable species like Teak and Bija. Stump planting of Teak shall only be considered in well drained areas with crown density less than 0.2. The remaining plantation area will be brought under the mixed species plantations, using suitable species like Shiwan, Maharukh, Kinhi, Siras Semal, Sissoo, Babul and other NTFP species at suitable sites. Some suitable species like Ficus, Ber, Babul etc. species should also be planted to improve the habitat of wild animals and birds.

3.6.13 Associated Regulations and Measures:

Soil and Moisture Conservation Works: Soon after the receipt of approved treatment map, soil and moisture conservation works will also be taken along with marking and will be completed before the onset of monsoon in the next year. Standard Models of Soil and Moisture Conservation works, other than CCT/SCT, will be carried out after it is sanctioned by the competent authority only. CCT/SCT should only be taken, if necessary, and the estimate should be examined and sanctioned by competent authority. The details of these works are given in the chapter of miscellaneous regulation.

Protection from fire and grazing is essential for success of natural and artificial regeneration. All annual coupes will be provided strict fire protection and will remain closed to grazing, till completion of the 6th year cleaning operations.

Improvement Working Circle Map of Gondia Forest Division



CHAPTER 4

AFFORESTATION WORKING CIRCLE

4.1: AFFORESTATION WORKING CIRCLE: The area of this Working Circle has been clearly marked on the GIS based map of 1:50000 which are appended and a copy of the same is given on a smaller scale on A4 size here.

4.2: GENERAL CONSTITUTION OF THE WORKING CIRCLE:

The Afforestation Working Circle constitutes about 21.44 % of the forest areas of the division. It includes 34078.693 ha of the forest areas comprising of Reserved Forest to the extent of 4170.154 ha, Protected Forests 28130.962 ha. including Gose PF and Unclassed Forest 1777.577 ha. The Compartment and Village wise area of this working circle allotted to various Ranges is shown in the Table No. 4.1.

Table No. 4.1: Compartments Allotted to Afforestation Working Circle

S. N	Name of the Range	RF		PF		Unclassed Forest (Total Comptt.)	Unclassed Forest Classed Area (in ha)	Total Comptt.	Total (in.ha.)
		No. of Comptt.	Area in Ha.	No. of Comptt	Area in Ha.				
1	Tiroda	0	0	7	664.344	0	0	7	664.344
2	Gondia	3	290.020	19	2679.741	0	0	22	2969.761
3	Goregaon	4	602.300	24	2972.434	3	827.677	31	4402.411
4	Amgaon	2	209.900	24	2599.138	0	0	26	2809.038
5	Salekasa	2	363.400	19	1634.590	0	0	21	1997.990
6	North Deori	0	0	27	3665.958	0	0	27	3665.958
7	South Deori	0	0	8	513.106	0	0	8	513.106
7	Chichgarh	0	0	9	1650.466	0	0	9	1650.466
9	Sadak Arjuni	8	1728.234	38	4794.643	4	586.454	50	7109.331
10	Nawegaon bandh	1	17.500	13	1002.558	2	182.551	16	1202.609
11	Ghothangaon	5	242.400	10	2014.137	1	180.895	16	2437.432
12	Arjuni Morgaon	4	716.400	28	3939.847	0	0	32	4656.247
Total		29	4170.154	226	28130.962	10	1777.577	265	34078.693

The open forest areas having density less than 0.4 and with rootstock and shrubby growth as well as open forests without rootstock, where artificial regeneration appears necessary to restore productivity, are included in this working circle.

It includes a bulk of the old Afforestation Working Circle and sizeable area of Coppice with Reserve Working Circles of previous plans. Most of these areas are located in the immediate vicinity of the villages and under very heavy pressure of grazing, which is the main reason for their deterioration.

Based on results of enumeration results, vegetation pattern decipherable in the satellite imageries & basal area per ha, compartments have been allotted to this working circle. The following criteria have been used for allocation of compartments to the Afforestation Working Circle.

1. Compartments having blank areas.
2. Compartments having poor quality open forests (degraded forests), which need some tending operations to become productive.
3. Compartments showing potential for natural regeneration indicated by the presence of good shrubby vegetation & rootstock.
4. Compartments having large proportion of area under forest blanks and have less than 5 sqm per ha basal area.
5. Compartments showing potential for natural regeneration indicated by the presence of good shrubby vegetation. Natural regeneration of common species is present but its extent is far from being adequate. Heavy grazing pressure has resulted in compaction of the soil with little sub-soil moisture. Young recruits of species like Ain, Dhaoda, Bhirra and Teak, etc. are found in many compartments but die-back without getting established. Due to excessive grazing, fires and refractory nature of areas establishment of NR is very poor and issue of concern for the department.

4.3: GENERAL CHARACTERISTICS OF THE VEGETATION:

This working circle generally comprises of degraded open forest areas interspersed with forest blanks or brushwood. The blank areas have dominance of shrubby growth and inferior grasses. The common grasses include *Ghonad*, *Kusal*, *Bhurbhusi*, *Marvel* and *Sheda*. While *Ghot*, *Khair*, *Eruni*, *Bharati*, *Ber*, *Kuda*, *Dikamali*, etc. are the common thorny or brushwood species. Tarota, Gokhru and Rantulsi are the common weeds. Lantana has infested in many places. At places Parthenium has also been noticed. The allotted areas in general are highly degraded, under stocked and open with crop density usually less than 0.4, though patches of better stocked areas are also found, in some compartments. The PF areas allotted to this WC, especially, those near the habitations, are degraded to the extreme condition and lays bare without any significant tree crop.

The crop consists mainly of scattered trees or patches of open forests. The principal species is *Teak*, *Saja* and its common associates are *Dhaoda*, *Bhirra*, *Rohan*, *Tendu*, *Lendia*, *Salai*, *Mowai*, *Char*, and *Palas*, etc. *Arjun*, *Jamun* and *Ficus* are found along the streams.

The dominant site quality is IV. The canopy density of the vegetation varies from blank to 0.4. The crop is generally young with occasional middle aged or mature trees. Natural regeneration of common species is very less due to compactness of soil because of uncontrolled grazing & fire and hence their establishment is poor.

Table No.4.2: Species and Girth-wise Distribution in Afforestation Working Circle

Species	g15 30	g31 45	g46 60	g61 75	g76 90	g91 105	g106 120	g121 135	g136 150	g151 up	Total	Basal Area (m ²)
Ain	2.446	1.194	0.434	0.319	0.206	0.130	0.118	0.074	0.036	0.059	5.017	0.106
Aonla	0.145	0.059	0.030	0.024	0.018	0.016	0.003	0.000	0.001	0.000	0.297	0.006
Behada	0.077	0.099	0.046	0.027	0.020	0.010	0.006	0.000	0.001	0.006	0.292	0.007
Bel	0.099	0.076	0.019	0.014	0.013	0.001	0.002	0.011	0.000	0.000	0.234	0.005
Bhirra	0.797	0.526	0.272	0.150	0.092	0.047	0.014	0.010	0.004	0.008	1.919	0.034
Biba	0.087	0.073	0.026	0.008	0.019	0.003	0.005	0.005	0.000	0.000	0.226	0.005
Bija	0.471	0.199	0.130	0.106	0.123	0.096	0.112	0.085	0.024	0.056	1.401	0.062
Bor/Ber	0.026	0.000	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.029	0.000
Char	1.424	0.706	0.293	0.082	0.051	0.008	0.012	0.002	0.000	0.000	2.578	0.029
Chichwa	0.059	0.070	0.058	0.031	0.020	0.015	0.004	0.001	0.000	0.001	0.258	0.006
Dhaman	0.023	0.009	0.010	0.009	0.016	0.001	0.000	0.000	0.000	0.000	0.066	0.002
Dhawada	2.134	0.975	0.359	0.178	0.126	0.066	0.081	0.045	0.007	0.033	4.004	0.068
Garadi	1.446	0.610	0.337	0.132	0.071	0.026	0.011	0.004	0.000	0.001	2.638	0.033
Haldu	0.006	0.013	0.015	0.016	0.010	0.000	0.005	0.003	0.016	0.015	0.099	0.008
Hirda	0.209	0.037	0.015	0.015	0.011	0.006	0.006	0.003	0.005	0.006	0.314	0.006
Kalam	0.099	0.023	0.003	0.009	0.007	0.008	0.001	0.000	0.000	0.000	0.151	0.002
Kasai	0.059	0.060	0.081	0.079	0.043	0.003	0.004	0.001	0.000	0.003	0.333	0.009
Khair	0.303	0.120	0.088	0.032	0.019	0.000	0.000	0.000	0.000	0.000	0.562	0.007
Kulu	0.004	0.006	0.002	0.003	0.002	0.001	0.000	0.000	0.000	0.000	0.018	0.000
Lendia	2.682	1.044	0.405	0.223	0.186	0.126	0.021	0.004	0.000	0.002	4.694	0.064
Moha	1.211	0.717	0.190	0.107	0.048	0.049	0.033	0.039	0.050	0.124	2.569	0.069
Mokha	0.008	0.011	0.022	0.006	0.000	0.002	0.001	0.005	0.004	0.000	0.060	0.003
Mowai	0.415	0.225	0.183	0.143	0.126	0.066	0.037	0.035	0.004	0.016	1.249	0.038
Other	3.14	1.23	0.66	0.38	0.25	0.12	0.07	0.04	0.03	0.07	5.99	0.11
Palas	1.146	0.405	0.284	0.151	0.072	0.033	0.019	0.006	0.011	0.011	2.137	0.034
Rohan	0.436	0.222	0.118	0.069	0.036	0.006	0.007	0.001	0.000	0.000	0.897	0.013
Salai	0.031	0.061	0.051	0.054	0.052	0.040	0.011	0.017	0.010	0.024	0.351	0.020
Semal	0.039	0.026	0.020	0.027	0.017	0.005	0.003	0.003	0.003	0.006	0.150	0.006
Shisham	0.025	0.016	0.010	0.005	0.008	0.000	0.000	0.000	0.000	0.000	0.065	0.001
Shiwan	0.036	0.030	0.022	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.092	0.001
Surya	0.181	0.209	0.116	0.087	0.044	0.017	0.019	0.000	0.000	0.000	0.673	0.015
Teak	5.203	2.221	0.548	0.160	0.077	0.024	0.010	0.003	0.005	0.009	8.260	0.076
Tendu	1.007	0.202	0.084	0.042	0.018	0.011	0.004	0.003	0.001	0.006	1.379	0.014
Tiwas	0.023	0.031	0.024	0.047	0.025	0.007	0.006	0.001	0.002	0.005	0.171	0.007
Total	25.494	11.502	4.948	2.744	1.829	0.940	0.627	0.402	0.216	0.461	49.163	0.866

4.4: FELLING SERIES, CUTTING SECTIONS AND JFM AREAS:

Felling series and annual coupes: The entire area of this working circle has been divided into 19 felling series with an average area of 1934.08 ha. The area of each felling series has been further divided into 20 annual coupes with an average area of 96.70 ha. Details are provided in the **Appendix No. XXXI**.

4.5: BLOCKS, COMPARTMENTS AND JFM AREA:

Details of the compartment in the working circle have been given in **Appendix No. XXXIX**.

4.6: SPECIAL OBJECTIVES OF MANAGEMENT:

The special objective of management of this working circle is to restore the vegetative cover of these degraded and open areas, primarily, by tending of existing natural regeneration and rootstock and supplementing it with plantations, wherever, necessary. The term afforestation include reforestation and rootstock management for the purpose of this working circle.

The site protection will induce natural regeneration; and tending operations will lead to improvement and establishment of existing saplings, rootstock and poles. The successful result would provide services of the life-support system, along with providing small timber, poles and firewood to meet bona fide future needs of the local people, including the nistar.

The special objects of management of this working circle are, as follows:

1. To restore the vegetative cover of the degraded and open areas.
2. To increase their productivity by site protection and tending of natural regeneration and rootstock, supplementing it with plantations of desired species, wherever, necessary, preferable through JFM.
3. To check the loss of top soil by adopting suitable soil and moisture conservation measures and to increase the water absorption capacity of the soil.
4. To meet the local demands of fuel wood, small timber and poles through active involvement of Gram Panchayats and other village institutions.
5. To improve the habitat of wild animals and birds.

4.6.1: Analysis of the Crop:

Stock Mapping: The stock mapping has been done by the territorial staff of Gondia Division.

Age and Density: The crop of forest areas under this working circle is mostly young to middle aged with occasional mature trees having density below 0.4.

- **Site Quality:** Site quality governs the harvestable girth. The information from the previous plan has been used to delineate and digitise the various site quality classes.
- **Enumeration:** Enumeration was carried out during the earlier plan period. Most of the areas under this Working Circle are degraded with little vegetation growth. It includes complete enumeration of species and girth distribution of all trees, regeneration and recording of site quality and density. Analysis of the data collected from these sample plots is given in **Appendix No. XX**.

4.6.2: Silvicultural System:

The area will be regenerated with Teak, Miscellaneous tree species and Bamboos. No harvesting is required in this working circle. Only tending of existing natural regeneration, i.e. the saplings, coppice shoots and poles, will be carried out and if the NR is absent it will be supplemented by plantations, would be the main activities in this working circle.

Large areas of this working circle have inadequate sub-soil moisture, highly compact soil structure and heavy biotic pressure. These are the main limiting factors for the establishment of seedlings in this area. Top soil has been washed away and as a result vast areas do not have even adequate soil-depth to support tree crop. As a consequence, a large chunk of these areas lay bare without any significant vegetation. Hence, intensive soil and moisture conservation measures and tending of existing rootstock have been proposed to be given priority over plantation.

In addition, concept of 'Ecological Index' has been proposed for deciding the number of seedlings to be planted per hectare, over the traditional method of planting based only on soil-depth zonation approach. Ecological Index of a site gives an idea as to number of plants which could be sustained per hectare on a particular site depending upon the various locality factors of the area. It is based upon the climatic and edaphic conditions prevailing in the area and is determined by the formula, as follows:

$$\text{Ecological Index} = P \times D / Tr \times EPT$$

Where,

P = Annual precipitation in mm.

D = Number of rainy days in a year.

Tr = Range of maximum temperature averages.

EPT = Potential Evapo-transpiration in mm.

There is no need for planting more seedlings per ha than those could be sustained on a particular site. The emphasis is to grow the optimum number of seedlings per ha, which should grow into a healthy future stock with little mortality. Ecological Index for these areas is calculated on the basis of data of Bhandara to determine the number seedlings to be planted per hectare in these areas. The ecological index for Gondia division is 13.15. Therefore, 2500 seedlings per hectare shall be planted in these areas.

4.6.3: Rotation Period: No rotation period is fixed.

4.6.4: Harvestable Diameters: Not Applicable

4.6.5: Reducing Factors and Reduced Areas: Not Applicable

4.6.6: Treatment cycle: Treatment cycle is fixed as Ten years. The entire area of this working circle will be covered in a period of Ten years. In this working plan coupe no. XI of previous plan is treated as coupe no. I and sequence to be followed.

4.6.7: Division Into Periods and Allotment to Periodic block (Pb): Not Applicable.

4.6.8: Calculation of the Yield

Regulation of yield: No yield is prescribed for this working circle. Only removal of dead trees (after retaining 2 dead trees/ha as snags) are prescribed.

4.6.9: Table of Felling: Not Applicable.

4.6.10: Method Of Executing The Felling: Not Applicable.

4.6.10.1 Demarcation, Treatment Map and Treatment Prescription:

The demarcation of coupe will be carried out, along with other coupes, as per the prescriptions mentioned in the chapter of Miscellaneous Regulations.

Treatment Map: Delineation of areas falling under various treatment Types will be mentioned in the treatment maps under the following general guidelines:

1. An area having more than 25° slopes and more than a quarter hectare in extent must be shown on the map as the A1-Type: steep slope. Smaller areas of steep slope, even if not marked on the map, will also receive the prescribed treatment.
2. 20 meter wide buffer along streams will be measured from the bank or the high flood mark. Similar buffer of the A2-Type areas will be marked along water bodies and tanks.
3. The A3-Type (excessive erosion prone) includes seasonally flooded areas.
4. In B-Type areas the crop is degraded and open. Natural regeneration would be considered adequate if at least 400 good established saplings per hectare are present. The same criterion will be applied for the rootstock. B1-Type will include the areas with sufficient Natural Regeneration, whereas B2-Type will include degraded lands without sufficient Natural Regeneration.
5. The C-Type areas would include groups of naturally grown poles of 15 to 45 cm GBH and old plantations.
6. The D-Type areas have dense vegetation and need proper treatment if found.

Preparation of Treatment Maps: The Range Forest Officer shall prepare the Treatment Map of the coupe after a thorough inspection of the area, showing the various Treatment Type areas. The Assistant Conservator of Forests will check the treatment map and will make corrections in the map, if necessary. The Deputy Conservator of Forests will approve the treatment maps after careful examination.

The treatment maps will bear date of inspection by the Range Forest Officer and the Assistant Conservator of Forests under their official seals and signatures.

Treatment Prescribed: The treatment prescribed for various treatment- Type areas are as follows:

A-Type Areas: Protection Areas:

4.6.10.2 Soil and Moisture Conservation: Gully plugging and other soil and moisture conservation works, as described in the chapter of Miscellaneous Regulations shall be taken in the A1 and A3-Type areas. Such works may be taken up in the A2-Type areas, if not detrimental to the riparian ecosystem.

4.6.10.3 Regeneration: Bush sowing of *Khair, Neem, Maharukh, Sandal, Babul and other local* seeds is prescribed to be carried out. Any one species should not constitute more than one fourth of the disseminated seeds. A proper coupe wise record should be maintained for the bush sowing operation.

In the A2 and A3-Type areas, *stakes of Ficus spp., Pangara, Salai or other suitable* species will be planted at six-meter interval, and tussocks of Khas grass will be planted on suitable sites. If necessary, plantation of desired miscellaneous species shall be taken on suitable areas.

Harvesting Prohibited: Harvesting of standing trees (dead or alive) is strictly prohibited.

B- Type Areas: Under-stock Areas: These areas are categorised into 2 types:

1. **Treatments for B1-Type Area:** Natural Regeneration Management: Guidelines for the Natural Regeneration Management:
 - i. **Tending of Natural Regeneration (of seed origin):** All seedlings and saplings (of seed origin) of valuable species, more than 60 cm in height, will be nursed as future crop. Spacing operations in favour of valuable species, if required, will be carried out to leave nearly 400 saplings per hectare at an average of 5 metre spacing. The natural regeneration shall be assisted and encouraged by soil working and mulching around them, in the following manner. Such identified areas suitable

for tending of natural regeneration should be shown on the treatment maps & grid wise recording of such valuable species should be done along with GPS reading.

- ii. **Singling of Coppice Shoots:** One healthy and promising coppice shoot will be retained on the stumps and the rest be removed to serve as future crop. However, coppice shoots interfering with promising saplings of seed origin shall be removed. Such coppice shoots should also be close enough to the ground so that it would not topple after gaining volume and weight and would be able to, subsequently, develop root system of its own.
- iii. **Coppice Management of Damaged and Malformed Saplings:** The saplings and poles up to 45 cm GBH having one third of the stem damaged and malformed shall be coppiced by cutting flush to the ground. Such coppicing, however, should not expose the ground, causing erosion and leading to soil loss. Poles having at least 2.50 meter of clean bole will not be treated as malformed.
- iv. **Subsequent operation for B1-type of areas:-** Seedling of seed origin will be given preference.
 - a. **First year Operations:** Weeds in one-meter diameter around saplings of valuable species shall be cleared during the first week of July. Uprooted weed, grasses and leaf-litter shall be mixed in the upper layer of soil as the organic mulch to facilitate loosening and aeration of the soil by worms and insects. One soil working will be carried out in October.
 - b. **Second year Operations:** The soil working in October will be repeated in the following year. However, one scrape weeding of one-meter diameter will be carried out in the first week of August around the seedlings.
 - c. **Third year Operations:** Singling of coppice shoots, climber cutting and shrub clearance shall be repeated in third year.
2. **Treatments for B2-Type Area:** Artificial Regeneration (Plantations): Suitable sites of the B2-Type areas shall be brought under Artificial Regeneration. Teak stumps and saplings of suitable miscellaneous species shall be planted as per site suitability. Stump planting of Teak shall be considered only in areas with well drained soil with crown density less than 0.2. All planting operations shall follow the guidelines described in the chapter of Miscellaneous Regulations.

Local species of Bamboo shall be planted only when the Teak or Miscellaneous species get established and there is no risk of getting suppressed by bamboo clumps.

C & D- Type Areas: Pole Crop and Matured Crop:

1. **Thinning:** Thinning of young and pole crop will be carried out maintaining average spacing of one-third of the crop height in such patches. Thinning is to be carried out as per guidelines prescribed in the miscellaneous regulations.
2. No planting shall be done in these areas.
3. Over matured, malformed and dead trees to be removed
4. **Tending of Natural Regeneration:** Singling and spacing out will be carried out among saplings of Teak and other valuable species. Spacing operations should leave nearly 400 saplings per hectare. The natural regeneration shall be encouraged by soil working and mulching around them as per the chapter of Miscellaneous Regulations.

4.6.11: Subsidiary Silvicultural Operations Cleaning and Thinning: Not Applicable

4.6.12: Regeneration:

4.6.12.1 Choice of Species:

- i. Valuable local species suitable for the site and favoured by the local village communities will be preferred in plantations. *Teak, Shisham, Khair, Shiwan, Sissoo, Siras, Kullu, Karanj, Chichwa, Aonla, Chinch, Neem, Babul, Sitaphal, Jamun, Karnaj, etc.* shall be considered. Seedlings of NTFP including, edible fruit-yielding forest species and medicinal plants may constitute up to 10 percent of the plantation. For the benefit of wildlife, *Ficus* species (2 seedlings per ha) shall also be used in plantations. An officer not below the rank of Assistant Conservator of Forests in consultation with the Dy. Conservator of Forests will approve the final choice of species.
- ii. Mixed species plantations should include up to 50 % of Teak and fairly good proportion of timber, fodder, firewood fruits and MFP yielding species as mentioned in the above para.
- iii. Bamboo plantation should also be taken on suitable land but with a precaution that it should not suppress other valuable species. In case of bamboo plantation in Teak or misc. plantations, it should be taken in the sixth year of the previous plantations (Teak or Mixed).
- iv. Nurseries of Root Trainer/Poly pots should be raised in the previous financial year just after monsoon.
- v. Seedlings of species like Neem, Jamun, etc. should be raised on the mother beds during the rainy season and subsequently transferred to poly-pots.

- vi. Seedlings of slow growing species *like Bija, Haldu, Mahua, Hirda etc.* should be planted after two monsoons.
- vii. Bamboo seeds should also be sown on the mother beds. The rhizomes should be transplanted on the same bed for at least twice then after one year they should be transplanted to poly pots of suitable size. Seed sowing directly in the pots should be avoided as it may lead to a clump with more than one species.
- viii. Seeds of all planting stock must be from a known healthy source and it should be recorded in the seed register of the nursery as well as the concerned plantation registers.

4.6.12.2 Method of Regeneration:

Natural Regeneration: Natural Regeneration shall be given preference over plantation. The existing NR and rootstock shall be tended as per the prescriptions on Natural Regeneration given in the chapter of Miscellaneous Regulations Management. Plantations shall be taken as a supplementary activity to NR in the under stocked areas.

Tending operations for Natural Regeneration in the D-Type and rootstock management in the B1-Type shall be taken up along with the coupe operations as given in the chapter of Miscellaneous Regulations. All the operations required for the tending Natural Regeneration shall be carried out in accordance with guidelines given in the **chapter of Miscellaneous Regulations.**

4.6.12.3 Artificial Regeneration: Plantations shall be taken only in the B2-Type and A-Type areas of the Afforestation Working Circle having inadequate Natural Regeneration. Plantations are proposed to be undertaken in accordance with the Ecological Index of the site and Plantation Guidelines described in the **Chapter of Miscellaneous Regulations.** Plantation register is to be maintained as per **Appendix No. LII.** Bamboo plantations should also be given priority and areas suitable for bamboo will be brought under the Bamboo plantation.

Necessary precautions should be taken so that no other plantation or young crop of valuable species is suppressed by the planted Bamboo.

Stump planting of Teak shall be considered in areas with crown density less than 0.2 and found suitable for Teak planting. The remaining plantation area will be brought under the mixed species plantations using suitable species. One Stage Plantation has been proposed for entire Gondia Division.

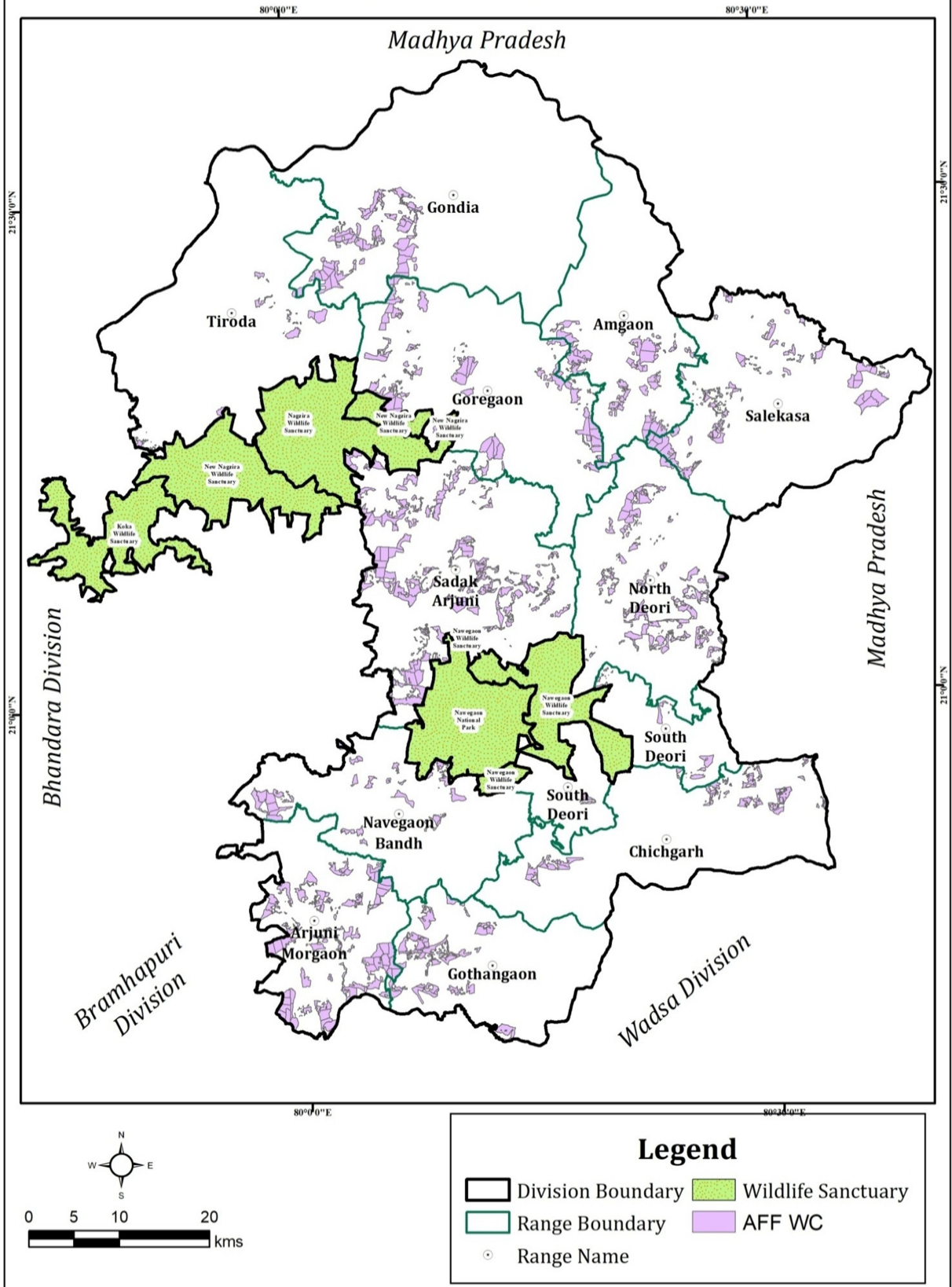
4.6.13: Associated Regulations and Measures:

4.6.13.1 Role of JFM Committees: Involvement of the Joint Forest Management Committees, Village Forest Protection Committees, Village Panchayats or other active Village Organisations would be an integral component of all the plantation activities as per Government guidelines for implementation of JFM scheme. The modified guidelines to implement various activities under JFM programme issued by government vide Government Resolution dated 5th October 2011 & 22nd December 2011 should be followed while formulating micro-plan under JFM. These JFM committees should be encouraged and motivated for the protection of the Plantations. Protection from fire and grazing is essential for the success of any natural and artificial regeneration.

4.6.13.2 Closure to Grazing and Fire Protection:

Plantations will be provided fire protection and complete closure to grazing for 5 years or more as per the provisions in BFM Vol. II depending upon the growth and establishment of seedlings so that when the areas are open for grazing; the established seedlings are beyond the reach of cattle from browsing. The DCF Gondia will examine the area closed for grazing at the end of 5th year operation and decide whether the coupe requires further closure depending upon growth of seedlings and recommend to CCF (T) Nagpur for its further closure for a specific period, so that the seedlings get established.

Afforestation Working Circle Map of Gondia Forest Division



CHAPTER 5

PROTECTION WORKING CIRCLE

5.1 **PROTECTION WORKING CIRCLE:** The area of this Working Circle has been clearly marked on the GIS based map of 1:50000 and a copy of the same is given on a smaller scale on A4 size here.

5.2 GENERAL CONSTITUTION OF THE WORKING CIRCLE:

The catchment areas of the major, medium and minor irrigation projects of Gondia Division are included in this working circle. It extends over to 11318.628 ha. of forest areas, comprising of 7710.117 ha Reserved Forests and 3608.511 ha. as the Protected Forest.

Table No.5.1: Range-wise Compartment allocation to Protection Working Circle

S. N	Name of the Range	RF		PF		Total Comptt.	Total (in.ha.)
		No. of Comptt.	Area in Ha.	No. of Comptt	Area in Ha.		
1	Tiroda	0	0	0	0	0	0
2	Gondia	0	0	0	0	0	0
3	Goregaon	0	0	0	0	0	0
4	Amgaon	0	0	0	0	0	0
5	Salekasa	0	0	4	693.745	4	693.745
6	North Deori	2	386.500	0	0	2	386.500
7	South Deori	10	1695.900	4	444.127	14	2140.027
8	Chichgarh	14	2488.660	6	940.061	20	3428.721
9	Sadak Arjuni	7	1526.047	3	1079.524	10	2605.571
10	Nawegaon bandh	0	0	1	344.703	1	344.703
11	Ghothangaon	0	0	0	0	0	0
12	Arjuni Morgaon	6	1613.010	1	106.351	7	1719.361
Total		39	7710.117	19	3608.511	58	11318.628

Gondia district is known for its major and minor water tanks. The catchment areas of most of these water bodies lie in the forest. To protect these water bodies, their catchments need to be protected with good quality vegetation on it. The majority of the areas, included in this WC, have a submergence of more than 10 ha and catchments of more than 200 ha. It includes various irrigation projects of Gondia Forest Division, besides some small water bodies inside the forest have also been included in this Working Circle.

Protection and soil conservation treatments in these forests is necessary for site protection, preserving the steep and precipitous slopes and reducing silt load to the major dams or water bodies in the division. Following criteria have been used for the allocation of compartments to this working circle:

1. The Compartments having more than half of its areas on the steep slope or in the stream buffer.
 2. The Compartments close to the major dams in the catchments having less than half of the area under good forest cover.
 3. The Compartments critically close to the major dams necessitating their protection.
- Protection and soil conservation treatments in these forests is necessary for site protection, preservation of the steep and precipitous slopes and reduction of silt load to the major dams or water bodies.

5.3 GENERAL CHARACTERS OF THE VEGETATION

The forests covered in this working circle consists of mixed composition of species comprising Saja, Bija, Dhaora, Tiwas, Tendu, Moha, Garari, Lendia and Teak. Bamboo occurs at a few places in the middle storey. The species and girth class wise enumeration data is given in the Table No.5.2

Table No.5.2: Species-wise and Girth Class-wise Distribution in the PWC

Species	g15 30	g31 45	g46 60	g61 75	g76 90	g91 105	g106 120	g121 135	g136 150	g151 up	Total	Basal Area (m ²)
Ain	1.472	0.952	0.635	0.403	0.321	0.205	0.150	0.076	0.044	0.041	4.298	0.120
Aonla	0.037	0.065	0.071	0.073	0.046	0.020	0.014	0.007	0.003	0.000	0.338	0.012
Behada	0.027	0.030	0.035	0.022	0.035	0.027	0.019	0.009	0.003	0.015	0.222	0.013
Bel	0.009	0.011	0.007	0.013	0.013	0.023	0.010	0.000	0.000	0.000	0.085	0.004
Bhirra	0.440	0.395	0.202	0.131	0.049	0.039	0.025	0.011	0.012	0.005	1.309	0.028
Biba	0.078	0.083	0.061	0.041	0.020	0.016	0.007	0.000	0.002	0.001	0.309	0.008
Bija	0.136	0.124	0.160	0.162	0.207	0.221	0.169	0.099	0.053	0.061	1.392	0.090
Bor/Ber	0.000	0.003	0.000	0.003	0.003	0.000	0.000	0.000	0.000	0.000	0.010	0.000
Char	0.307	0.358	0.164	0.091	0.041	0.015	0.008	0.001	0.003	0.000	0.988	0.017
Chichwa	0.034	0.042	0.039	0.028	0.013	0.015	0.010	0.014	0.003	0.005	0.202	0.009
Dhaman	0.036	0.068	0.031	0.030	0.017	0.000	0.000	0.000	0.000	0.000	0.182	0.004
Dhawada	0.908	0.624	0.315	0.213	0.167	0.115	0.085	0.035	0.023	0.035	2.520	0.068
Garadi	2.174	1.494	1.000	0.560	0.273	0.089	0.051	0.015	0.003	0.003	5.663	0.099
Haldu	0.021	0.025	0.022	0.019	0.011	0.015	0.015	0.009	0.003	0.020	0.160	0.010
Hirda	0.115	0.077	0.023	0.040	0.033	0.010	0.008	0.006	0.003	0.003	0.318	0.009
Kalam	0.012	0.024	0.018	0.012	0.017	0.017	0.015	0.003	0.007	0.003	0.129	0.007
Kasai	0.052	0.044	0.069	0.057	0.044	0.011	0.009	0.004	0.002	0.005	0.298	0.011
Khair	0.017	0.096	0.035	0.023	0.007	0.001	0.000	0.000	0.000	0.000	0.179	0.003
Kulu	0.000	0.000	0.000	0.000	0.000	0.003	0.006	0.000	0.000	0.000	0.010	0.001

Lendia	1.153	0.469	0.238	0.117	0.093	0.051	0.021	0.009	0.006	0.005	2.162	0.034
Moha	0.160	0.136	0.129	0.102	0.096	0.071	0.066	0.044	0.023	0.074	0.902	0.051
Mokha	0.009	0.019	0.008	0.014	0.019	0.007	0.007	0.003	0.005	0.000	0.090	0.004
Mowai	0.137	0.174	0.133	0.137	0.127	0.090	0.058	0.023	0.011	0.009	0.900	0.037
Other	1.71	1.29	0.80	0.49	0.32	0.19	0.12	0.09	0.06	0.18	5.26	0.16
Palas	0.307	0.246	0.137	0.075	0.086	0.036	0.017	0.012	0.006	0.003	0.924	0.022
Rohan	0.166	0.218	0.165	0.104	0.088	0.037	0.015	0.010	0.005	0.000	0.809	0.022
Salai	0.033	0.026	0.025	0.027	0.053	0.057	0.048	0.037	0.016	0.039	0.361	0.029
Semal	0.000	0.011	0.003	0.008	0.010	0.003	0.010	0.011	0.000	0.006	0.063	0.005
Shisham	0.009	0.018	0.014	0.009	0.007	0.002	0.002	0.003	0.000	0.001	0.066	0.002
Shiwan	0.007	0.009	0.002	0.004	0.001	0.004	0.001	0.000	0.000	0.000	0.027	0.001
Surya	0.124	0.192	0.114	0.170	0.115	0.068	0.031	0.019	0.006	0.005	0.844	0.031
Teak	1.900	0.931	0.361	0.192	0.067	0.020	0.019	0.014	0.005	0.007	3.516	0.045
Tendu	0.466	0.101	0.031	0.034	0.036	0.025	0.021	0.015	0.003	0.007	0.739	0.015
Tiwas	0.007	0.029	0.012	0.038	0.027	0.025	0.016	0.003	0.003	0.006	0.167	0.009
Total	12.060	8.386	5.064	3.445	2.461	1.525	1.056	0.587	0.316	0.537	35.435	0.980

The site quality of the crop varies from IV to III. The quality is generally IVB in the upper slopes and IVA in the lower slopes. At few places, quality III is found on the planes, along streams and valleys. The density of crop generally varies from 0.3 to 0.7.

On the basis of enumeration results the species composition and their girth distribution in the forest areas under this working circle is given in the Table No.5.2

Natural Regeneration of common species is inadequate & their establishment failed in most of the places due to uncontrolled grazing and fire. The coppice regenerations of some species are found in the catchments areas, however, at places, its growth is malformed and stunted due to excessive grazing pressure, repeated hacking by the local people and regular fire.

Soil erosion is noticed all over the forest areas of the division. The top layer of soil which stores organic matter, and nutrients, on which plants feed, is lost in this process. It decreases the soil fertility, lowers the sub- soil water level and water holding capacity of the soil. Sheet erosion in plains and gully erosion on slopes is moderate in most of the areas of the forest. But it is increasing at an alarming rate in forest all over the division. The erosion increased due to excess harvesting of coupes without soil conservation works in the next year of felling, excessive grazing and repeated fires.

The details of the compartments included in this Working Circle has been provided in the **Appendix No. XXXII.**

5.4: FELLING SERIES, CUTTING SECTIONS AND JFM AREAS

Treatment series and annual coupes: The area of this working circle is divided into 5 treatment series with average area of 2263.72ha. Each treatment series is further divided into 20 coupes with average coupe size of 113.18 ha. Details of treatment series and coupes in given in **Appendix No. XXXIII**

5.5: BLOCKS, COMPARTMENTS AND JFM AREA (MARKED ON GIS BASED MAPS)

The details of compartment in this working circle have been provided in the **Appendix No. XXXII**.

5.6 SPECIAL OBJECTIVES OF MANAGEMENT:

The special objectives of management of Protection Working Circle are:-

1. To protect the fragile forest sites and to reduce the silt load on the water bodies, by preventing the siltation of the dams and water bodies by checking the soil erosion in the catchment areas falling in the forests, by maintaining good vegetation and by taking soil and water conservation measures.
2. To preserve and increase the vegetal cover and to help to enhance the quantity and quality of water of this tract.
3. To develop and optimise the natural biodiversity, wildlife and aesthetic value of these areas. This is aimed to cater the nature and wildlife conservation and education through Eco-Tourism. The irrigation dams and other water bodies are the life line of the agriculture in Gondia district. They play a crucial role in the development and wellbeing of the people of this tract. To check the soil erosion (siltation) and to arrest the water runoff, by maintaining very good and healthy vegetation and by taking proper soil and water conservation measures in the catchments is must for conservation of forests in the tract. This would help to increase the longevity of these water bodies.

5.6.1 ANALYSIS OF THE CROP:

Stock Mapping: The stock mapping has been done by SOFR unit Amravati with the help of staff of Gondia Forest Division. Entire area under this working plan has been stock- mapped.

Age and Density: The crop is mostly middle aged with scattered patches of mature and young crop. The density of the crop varies from 0.2 to 0.6 with some patches of open and degraded forest.

Site Quality: The site quality of the crop varies from IVA to IVB at few patches and some area of quality III is found on the plains. The information from the previous working plan has been used to delineate and digitise the various site quality classes.

Enumeration: Enumeration was carried out during previous plan period. Enumeration results have been given in **Appendix No. XX**. Inventory works include complete enumeration of species and girth distribution of all trees, regeneration and recording of site quality and density.

5.6.2: Silvicultural Systems:

To check the soil erosion, to improve the stocking in the under stocked area and to improve the habitat for wildlife, the following measures are proposed:

1. Silvicultural system is proposed on the pattern of Ridge to Valley Watershed Management System. In the eroded areas, areas prone to erosion, gullies and small nalas, appropriate soil and moisture conservation works, along with afforestation, should be taken to prevent further soil erosion, siltation of reservoirs and to enhance the vegetation cover and ground water table. Areas of each catchment should be treated as a unit.
2. No harvesting is proposed in the areas. Wind fallen trees of valuable species only should be extracted.
3. These areas are proposed to receive strict protection from grazing and fire and unwanted human interference.

As a matter of fact vegetative cover provides best protection to the soil and for these dibbling of seeds of suitable species in under stocked and blank areas will be done on planned basis and result of such a works will be evaluated in the following years.

5.6.3: Rotation Period: No Rotation period is fixed for this Working Circle as there is no production prescribed.

5.6.4: Harvestable Diameter: Not Applicable

5.6.5: Reducing Factors and Reduced Areas: Not Applicable

5.6.6: Felling cycle: Not Applicable. In this working plan coupe no. XI of previous plan is considered as coupe no. I and so on.

5.6.7: Division into Periods and Allotment to Periodic block (PB): Not Applicable

5.6.8: Calculation of the Yield: Not Applicable

5.6.9: Table of Felling: Not Applicable

5.6.10: Method of Executing the Treatment: Not Applicable

5.6.10.1 Demarcation, Preparation of Treatment Maps and Treatments:

The Range Forest Officer shall inspect the coupe thoroughly then after proper Demarcation, prepare the Treatment Map of the coupe, showing the various Treatment Type areas, on the compartment maps. The Assistant Conservator of Forests will check the treatment map and will make corrections in the map, if necessary. The Deputy Conservator of Forests will approve the treatment maps after careful examination.

The treatment map will bear date of inspection, signature and official seal of the Range Forest Officer and the Assistant Conservator of Forests.

The Treatment map will show the following areas for appropriate treatment :

5.6.10.2 Treatments Prescribed: The treatments prescribed for various treatment-type areas shall be, as follows:

5.6.10.2.1 A- Type Areas:

- i. **Harvesting of Trees:** No harvesting of trees is recommended in these areas except wind fallen trees of valuable species.
- ii. **Soil and Moisture Conservation:** Soil and moisture conservation works, as prescribed in the chapter of Miscellaneous Regulations shall be taken in A3 type areas.
- iii. **Bush Sowing:** Bush sowing of Khair, Neem, Maharukh, Sandal, Babool, Ber and other local seeds is to be carried out in the areas. Any one species should not constitute more than 25% of the total species.
- iv. **Stake planting:** Stakes of Ficus spp., Pangara, Salai or other suitable species will be planted at six-meter interval in the areas with sufficient moisture for these stakes.
- v. **Plantations:** If a suitable area, not less than 5 ha, is available, plantations of suitable miscellaneous species and Bamboo as per Miscellaneous Regulations shall be carried out.

5.6.10.2.2 B- Type Areas: Under-stocked and Open Areas: Treatments Prescribed:

- i. **Tending of Natural Regeneration :**
 - a. **Regeneration of Seed Origin:** Seedlings and Saplings: All seedlings and saplings of desirable species, more than 60 cm in height, will be nursed as future crop. Spacing

out operation will be carried out, to maintain 400 saplings per ha at an average spacing of 5 m. These saplings will be nursed by carrying out soil working and mulching for the next three years as it is prescribed in the SCI Working Circle.

- b. **Tending of Root Stock:** Operations like Singling of coppice shoots and Management of damaged and malformed saplings will be carried out as prescribed in the SCI Working Circle.
 - ii. No harvesting is recommended in these areas.
 - iii. Required Soil & Moisture Conservation Works, like nala bunding, gully plugging, grass plantation etc. will be carried out.
 - iv. Seed sowing of species like Babul, Neem, Khair, Sandal etc. will be carried out in areas where density of forest is less than 0.40.
 - v. Plantation of suitable species will be carried out if an area, not less than 5 ha of degraded or open forest (excluding natural blanks), is available.

5.6.10.2.3 C- Type Areas: Young Pole Crops:

- i. **Thinning:** In case the crop is very congested (including congested Bamboo clumps not covered under Bamboo (OL) working circle) and adversely affecting the growth and health of the crop, the required thinning will be carried out as per the thinning guidelines in the Miscellaneous Regulations.
- ii. No Plantation in this area will be taken.

5.6.10.2.4 D -Type Areas: Well Stocked Areas:

- i. **Harvesting:** No harvesting, except of dead trees, will be done.
- ii. Suitable soil and moisture conservation works, if required, will be taken in the erosion prone areas.
- iii. No plantation is recommended.

5.6.10.2.5 Marking Rules and Prescriptions

Marking technique and prescriptions described in the chapter of the Miscellaneous Regulations shall be followed.

Marking shall be carried out under the close supervision of the RFO and under guidance of ACF concerned. As all treatment type areas have been prescribed A-type treatment. Thus, the following, rules shall be observed for marking the trees;

A Type Areas:

Protection Areas: No tree shall be marked for felling.

5.6.11: Regeneration: Tending of NR and rootstock management as prescribed in the chapter of Miscellaneous Regulations will be given preference over plantations. The plantation will be restricted to the best sites of the B2-type areas. The one-stage plantation approach as described in chapter on Miscellaneous Regulations is prescribed for plantations on these areas. Suitable miscellaneous species and bamboo plantations on suitable areas will be carried out.

5.6.12: Associated Regulations and Measures:

5.6.12.1 Grazing Closure, Fire Protection and other Regulations:

Protection from fire and grazing is essential for success of natural and artificial regeneration. Following measures will be taken in this working circle.

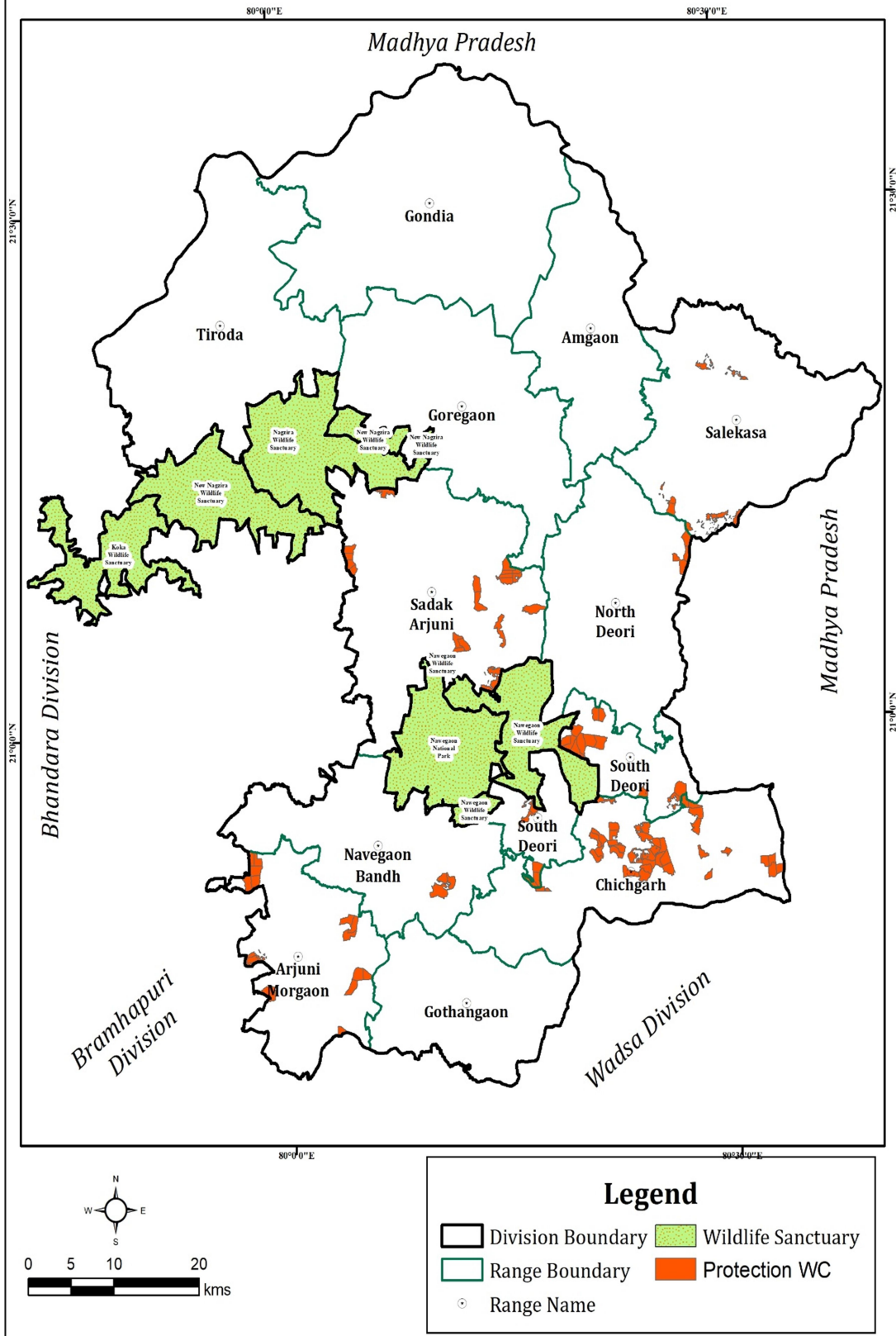
1. To protect the natural and artificial regeneration and to reduce the rate of soil erosion, leading to siltation of water bodies, protection from fire and grazing is essential.
2. Grazing closure will be enforced in the entire areas.
3. The entire area will be provided with Class-I fire line protection.
4. No new roads will be constructed in the Protection working circle areas. Cross-drains at appropriate interval should be maintained.
5. Five-year protection from the plantation year will be provided to all plantations.

5.6.12.2 Monitoring of the Catchment Areas:

As the catchments are very important for the water bodies, the results of the treatments given to these areas need to be monitored. The D.C.F with the help of Irrigation department will develop a monitoring system to assess the result of the implementation of the treatments prescribed in the plan. The main objective of the monitoring will be the quality of water and the quantity of silt in it, going to the water, bodies and the state of vegetation in this Working Circle.

All these records will be provided to the Working Plan Officer as this assessment will be useful for the future planning of these catchment areas.

Protection Working Circle Map of Gondia Forest Division



CHAPTER 6

MISCELLANEOUS WORKING CIRCLE

6.1: GENERAL CONSTITUTION OF THE WORKING CIRCLE

This working circle comprises forest areas not included in any other working circles and extends over an area of 38281.728 ha. It includes 7133.933 ha of the Reserved forests, 7543.479 ha of Protected forests, 3703.486 ha of unclassified forests & 19875.680 ha of Zudpi jungle and Acquired Private Forest 25.150 Ha. It constitutes 22.667 % of the entire area of the division. Area allotted to this working circle has been given in the Table No.6.1

Table 6.1: Areas Allotted to Miscellaneous Working Circle

S. N	Name of the Range	RF		PF		Zudpi Jangal (Total Comptt)	Zudpi Jangal Area (in ha)	Unclassified Forest (Total Comptt .)	Unclassified Forest Area (in ha)	Private Land 1970	Total Comptt .	Total (in.ha.)
		No. of Comptt.	Area in Ha.	No. of Comptt	Area in Ha.							
1	Tiroda	1	36.810	11	406.635	69	2147.500	0	0	0	81	2590.945
2	Gondia	0	0	28	663.100	112	3338.920	0	130.500	0	140	4132.520
3	Goregaon	0	0	5	187.500	48	1584.560	5	1311.290	2.61	58	3085.960
4	Amgaon	0	0	0	0	66	2520.860	2	127.592	0	68	2648.452
5	Salekasa	0	0	0		60	4691.250	14	1069.603	8.140	74	5768.993
6	North Deori	40	2096.980	0	0	02	6.060	4	1011.047	4.980	46	3119.067
7	South Deori	2	261.300	3	991.274	22	378.74	0	0	9.420	27	1640.754
7	Chichgarh	7	1634.230	5	2415.194	32	801.800	1	53.454	0	45	4904.678
9	Sadak Arjuni	0	0	0	0	42	1773.350	0	0	0	42	1773.350
10	Nawegaon bandh	10	2529.103	9	2879.756	23	1014.500	0	0	0	42	6423.359
11	Ghothangaon	2	575.510	0	0	9	1228.74	0	0	0	11	1804.250
12	Arjuni Morgaon	0	0	0	0	14	389.400	0	0	0.000	14	389.400
Total		62	7133.933	61	7543.479	499	19875.68	26	3703.486	0	648	38281.728

The compartments allotted to this working circle is given in the **Appendix No. XXXIV**. In this working plan coupe no. XI of previous plan is considered as coupe no. I and so on.

Following criteria have been used to assign areas to this working circle:

1. Compartments under the submergence.
2. Protected Forests & unclassified forests in some villages for which maps have not been made available.
3. Protected Forests in 87 villages notified in the year 1999.

4. Zudpi Jungle transferred to the Gondia Division for management or compensatory afforestation
5. Permanent forest nurseries and central depots in forest areas.
6. Forest areas used for infra-structural facilities such as residential buildings, seed storage unit rest houses and field offices.
7. Forest areas diverted for the non-forest use without disforestation.
8. Sacred grooves, worship sites and archaeological sites.

Maps of Protected Forests in 2 villages (Bhagi and Pipartola) and maps of unclassified forest in 7 villages (Sirpur, Jarugatta, Bondgaon, Bhagi, Changtola, Baki and Pangdi) were not made available. Similarly, maps were not made available for Protected Forests in 87 villages notified in 1999, during the preparation of the digital database. In absence of these maps, one compartment number has been assigned to the entire forest area of the village in each of these 96 villages. These areas have been included in Miscellaneous Working Circle for purpose of area accounting.

6.2: SPECIAL OBJECTS OF THE MANAGEMENT: The special objects of management of this working circle are as under.

1. Main objectives of this working circle are to maintain territorial integrity and comprehensive area accounting of the Reserved, Protected and unclassified Forests in the division. The special objects of management of this working circle are as under.
2. Provide provisions and guidelines for management of areas not included in other working circle of this plan.
3. Provide guidelines for protection and management of Zudpi jungles transferred to division from Revenue Department.

6.3: METHODS OF TREATMENT:

6.3.1 Protected Forests and unclassified forests not in database: Maps of some villages having the Protected Forests and the unclassified forests were not available at the time of revision of this working plan. Hence, these forest areas are not in the digital database or any other working circle. The division will supply these village maps to the office of CCF Working Plan, Nagpur for inclusion in the database at the time of next revision. Prescriptions of the Afforestation Working Circle will apply to these areas after inclusion in the database; as these forests are generally blank or open in stocking. Chief Conservator of Forests (T) Nagpur in consultation with, Working Plan Officer can approve the schedule of working, in all such cases.

6.3.2 Disforestation area not marked on the forest map: The division is proposed to prepare a comprehensive compilation of original disforestation maps. As the maps of disforestation areas in 47 villages are not available, disforestation maps shall be prepared by the division according to the disforestation notification and the revenue maps.

6.3.3 Area under infra-structural facilities: A number of rest houses, offices and residential facilities for field officials are situated within the forest areas. The extent of forest areas in use and locations of these buildings have not been recorded, exhaustively. The division is proposed to prepare their maps, and record present condition and occupancy of all the buildings in the forests for the purpose of their delineation on the forest maps and inclusion in the digital database. It is proposed to complete the work in first two years of the plan.

6.3.4 Religious and archaeological sites: A comprehensive inventory of sacred grooves, worship sites and archaeological sites shall be compiled in the Register of Cultural Sites and all such sites will be delineated on the forest maps. Their potential as sites for eco-tourism shall be explored and used to furtherance of eco-tourism in the division.

6.3.5 Areas diverted for irrigation projects and under submergence: No work is proposed for the forest areas under submergence, but the prescriptions of the Protection Working Circle will apply to the forests above the high flood level. Foreshore plantation of suitable species, like Jamun and Arjun should be carried out under the watershed and catchments development.

Deputy Conservator of Forests and the project authorities should jointly regulate fishing in such water bodies under existing laws to support the forest conservation activities. Net revenue from the fishing rights should be used to develop forest resources around the water body and for the development of adjoining villages.

Local communities through JFMCs and Village Protection Committees (VPCs) should have the first charge over the fishing rights provided members of these committees themselves carry out the fishing.

Areas under submergence are legally the Reserved or Protected Forests, cultivation shall not be allowed on such land.

6.3.6 Areas found eligible for regularisation of forest encroachment: The Government of Maharashtra had decided to regularise forest encroachments of the period of 1972–1978 in favour of the eligible persons. The process is still incomplete. Forest Department should take

up this matter and bring it to a logical conclusion of either rejecting the claim or issuing the land grants in favour of the eligible persons.

6.3.7 Zudpi Jungle Areas: These areas have been transferred to the division as a part of the land bank to be adjusted against the compensatory afforestation in the future. These areas extend over to 21970.20 ha & it should be maintained in three categories.

1. Category I :- Areas proposed under various projects.
2. Category II :- Areas under plantations.
3. Category III :- Remaining Area.

Category I areas are characterised by blanks and sparse vegetation having few dense patches scattered over entire area. The areas should be proposed for compensatory afforestation under various projects by the division. In the event of approval of projects, these areas will be taken up for plantations under compensatory afforestation scheme, as per prescriptions of the Afforestation Working Circle. Category II areas should be proposed for scheduled cleaning and thinning operations along with other plantations, in case these plantations are successful. The areas under Category III form the part of land bank intended to be used as areas for compensatory afforestation against future projects.

Due to their proximity to the habitations these areas require close watch and proposed to be provided protection against forest fires, over grazing, illicit cutting and encroachment. It is proposed that these areas shall be managed to primarily meet the local needs of fuel wood, fodder and small timber by involving local communities through JFMCs and other authorized village bodies.

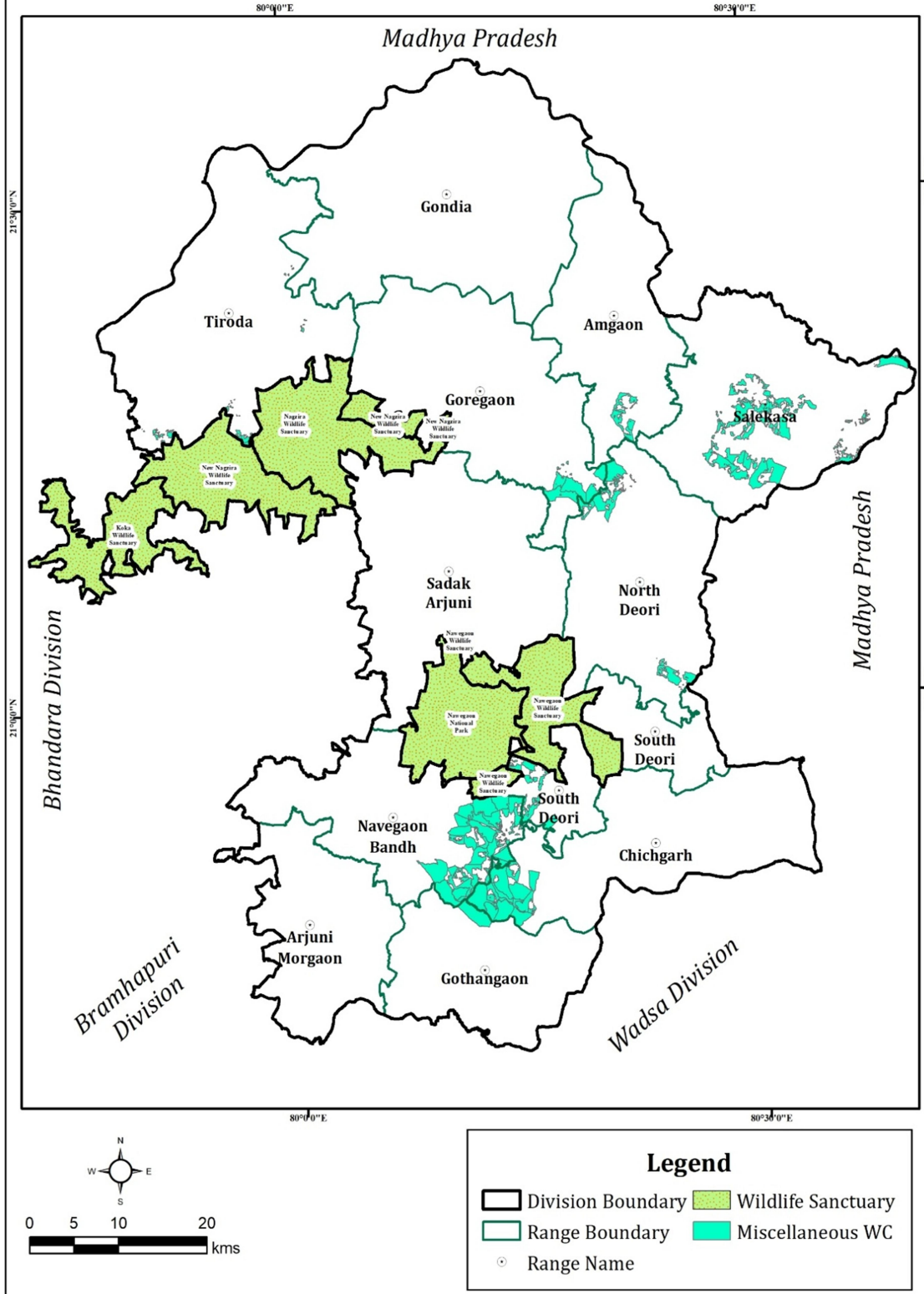
Zudpi Jungle areas included in this working circle are prescribed for survey and demarcation as described in the chapter of miscellaneous regulation. Areas under electric lines: The trees likely to interfere with efficient power transmission may be felled under the provisions of Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980 & government guidelines on receipt of the written request from the Executive Engineer, Maharashtra State Electricity Board.

Areas under the permanent nurseries and central depots: The central nurseries will be used for producing bamboo rhizomes and teak stumps; and non-teak seedlings in poly-pots or root-trainers as required for the plantations. The central depots will be used for sale of timber and bamboo by public auctions. These areas will be strictly protected from fire.

6.3.8 Areas under mining lease: The Range Forest Officer will assess impact of the mining activities on the forest resources every year in the forests falling in 250 metres from the boundary of forest area. Immediate remedial action will be taken up to mitigate the damage. The mining activities should not be allowed unless the prescribed rehabilitation plans and environmental guidelines are followed carefully. The guidelines of Hon'ble Supreme Court in case of mining lease adjacent to forest areas should be verified by Assistant Conservator of Forests every year & report to DCF Gondia in case of any violation of VSSA, 1980 or the orders of Hon'ble Supreme Court in the said matter.

6.3.9 Area diverted for non-forestry use: The progress regarding compliance of the conditions for the diversion should be monitored annually. If any project authority consistently defaults on this account, the division should recommend revocation of the diversion order and initiate legal action for violation of forest statutes. Use of diverted forestland for the purpose other than recorded in the diversion order should warrant fresh orders under the provisions of Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980.

Miscellaneous Working Circle Map of Gondia Forest Division



CHAPTER 7

BAMBOO (OVER-LAPPING) WORKING CIRCLE

7.1: BAMBOO (OVER-LAPPING) WORKING CIRCLE: The area covers the whole area of the division wherever bamboo and is therefore not specifically marked on GIS based map.

7.2: GENERAL CONSTITUTION OF THE WORKING CIRCLE: This working circle includes all the areas where Bamboo is present in workable quantity, natural or planted. Workable means that there are sufficient Bamboo clumps which require independent working. This includes areas of SCI as well as Improvement working circles. The total area of the working circle is 33371.918 Ha and is spread over 145 Compartments in all the ranges except Amgaon range. Actual area under Bamboo is 727.00 Ha. There are some old Bamboo plantations in the Division, some of which are not growing due to congestion. They are proposed to be worked as per the prescriptions given in this working circle.

7.3: GENERAL CHARACTERISTICS OF VEGETATION:

The general character of vegetation in the areas included in this working circle is given in the respective working circles; the condition of Bamboos only is described here. Bamboo crop is of both natural and planted in origin. The major species of Bamboo available in the forest areas of Gondia Forest Division is *Dendrocalamus strictus*. Katang bamboo (*Bambusa Arundinacea*) is found in small quantities in some stretches along the streams and rivers. In almost all the ranges, the Bamboo has come up due to plantations taken in different years in the past. The natural Bamboo clumps have deteriorated primarily due to illicit cutting. Even new recruits are cut by the illicit cutters.

The survival and growth of Bamboo varies from area to area. In most of the cases the clumps have become congested. In some areas, cleaning of clumps has been done in the past. But the work has been taken arbitrarily; therefore, all the areas need immediate attention. This irregular working has resulted in extensive damage to the bamboo clumps at places, and shrinkage of the bamboo area over the years. Approachable areas have been heavily exploited and the interior clumps suffer from congestion.

The growing stock has been considerably damaged due to over harvesting, frequent fires, illicit cutting and over grazing. The irregular working has resulted in extensive damage to the Bamboo clumps at places, and shrinkage of the Bamboo area over the years.

Approachable areas have been heavily exploited and the interior clumps suffer from congestion. Many of the successful plantations have not been worked leading to deformation and congestion of clumps.

7.4. FELLING SERIES, CUTTING SECTIONS AND JFM AREAS: Bamboo area have been divided into 14 Felling Series; each felling series further divided in to three coupes i.e. A, B & C.

7.5. BLOCKS, COMPARTMENTS AND JFM AREA: The abstract of Range wise Bamboo area distribution is shown in the table 7.1.

Table No.7.1: Range wise Bamboo Area Distribution

Range	No. of Comptts	Area (ha)	Area under Natural Bamboo Plantation (ha)
Tiroda	03	338.830	00
Gondia	01	10.00	225.00
Goregaon	02	473.354	220.00
Amgaon	00	00	80.00
Salekasa	28	5632.159	145.00
North Deori	04	691.789	00
South Deori	11	2351.343	00
Chichgarh	33	7785.738	00
SadakArjuni	05	1150.203	15.00
Nawegaonbandh	24	6071.952	81.00
Ghothangaon	31	8003.09	25.00
Arjuni Morgaon	03	863.460	1125.00
Total	145	33371.918	1916

7.6: SPECIAL OBJECTIVES OF MANAGEMENT:

Bamboo has a significant place in local economy. Local tribal and non-tribal families use bamboo for construction, fencing and for making variety of implements. Bamboo has a great potential as an alternative to the timber and supports handicraft artisans called Burads for their livelihood. It has significant value for interior decoration, furniture making and manufacture of other articles of domestic use. Hence, increasing the bamboo productivity in the division is very important for the development of local inhabitants of this region.

This working circle aims at improving the bamboo productivity for meeting local needs and demand in the surrounding areas.

1. This working circle aims at improving the Bamboo productivity for meeting local needs and demand in the surrounding areas.
2. Harvesting of Bamboo on scientific manner to obtained maximum sustained yield.
3. To meet the local people demand Agricultural, Crafts and, Artisans.
4. To protect the Bamboo clumps, both natural and artificial, from illicit cutting, browsing, fire and congestion.

7.6.1 Analysis of Crop

Stock mapping: The conventional stock mapping has also been carried out, besides the extensive enumeration exercise and density mapping through image processing and analysis of the satellite imageries. Stock mapping of bamboo is carried out along with respective working circle as presence of bamboo and the number of clumps.

Age and Density: The bamboo is of mostly of middle aged to mature (second year and above).

7.6.2. Silvicultural System

Each clump is prescribed to be treated as an independent entity for the treatment. Silvicultural system shall be the Culm selection system, each Culm to be treated as a stem. Clump cleaning is prescribed as an integral part of Bamboo harvesting operation. Successful old Bamboo plantations and patches of gregariously flowered areas are prescribed to be cleaned as per **para 7.6.10** under Bamboo harvesting.

7.6.3. Rotation Period: The rotational period is fixed for 3 years

7.6.4. Harvestable Diameter: Not applicable

7.6.5 Reducing Factors and Reducing Areas: Not applicable.

7.6.6 Felling Cycle/Cutting Cycle:

- i. Cutting cycle of 3-year duration is proposed for the Bamboo harvesting.
- ii. The entire area in the working circle has been divided into 9 cutting series of an average area 2514.02 Ha.
- iii. Each cutting series is further divided into three cutting sections of average size 737 Ha in the cyclic order viz. A, B and C; that will serve as annual coupes in each cutting series. The sequence of cutting is given in the **Appendix No. XXXV**.

7.6.7 Division into Periods and Allotment to Periodic Block (PB): Not applicable.

7.6.8 Calculation of Yield: For bamboo, yield is calculated based on number of culms in a clump (second- and third-year culms) per Ha. Most of the areas included in this working circle contain planted Bamboos at spacing of 6m x 6m. The growth of Bamboos differs from compartment to compartment and even in the same compartment. In natural Bamboo growth, the clump size varies. In area 5% enumeration of Bamboo will be done and the Bamboo will be classified in to three categories. Since in plantation, Bamboos are planted at 6m-6m, therefore, exact estimate of Bamboo clump can be made. In case of natural Bamboos also, the approximate estimate can be made as the Bamboos in this case will be confined to river streams and slopes. As per the enumeration the estimates of various works and yield of Bamboo will be made.

7.6.9 Table of Felling: The sequence of cutting is given in the **Appendix No.XXXV**.

7.6.10. Method of Executing the Felling:

7.6.10.1 Agency for Harvesting: Since the harvesting of Bamboo will require close supervision, it will be worked departmentally. The harvested Bamboos will be brought to the sale depots for further disposal.

7.6.10.2 Method of Harvesting (Bamboo clump management)

- **Demarcation:** The coupe due for working will be demarcated before the onset of monsoon, in the year in which they become due for harvesting, by erecting poles at suitable intervals. On the poles, compartment number, coupe number and name cutting series will be written. The coupe due for working in the regular working circle will be excluded from this, to avoid duplication of work.
- **Estimation of Clumps:** Most of the areas included in this working circle contain planted Bamboos at 6m -6m as well as natural. The growth of Bamboos differs from compartment to compartment and even in the same compartment. In natural Bamboo growth, the clump size varies.

Soon after the demarcation, the whole coupe due for working will be thoroughly inspected by RFO. The inspection will be carried out compartment wise and the area containing Bamboo will be shown on the treatment map. In this area 5% enumeration of Bamboo will be done and the Bamboo will be classified in to above three categories. Each bamboo clumps will be numbered and two percent of clumps in each compartment of the

coupe will be enumerated for the current year, previous year, mature and dead culms as well as intensity of cleaning operations. High cleaning intensity will mean presence of badly twisted culms, and moderate cleaning intensity would indicate presence of malformed and dead culms exceeding four in number. Fewer malformed and dead bamboos will suggest low intensity cleaning. Since in plantation, Bamboos are planted at 6m-6m, therefore, exact estimate of Bamboo clump can be made. In case of natural Bamboos also, the approximate estimate can be made as the Bamboos in this case will be confined to nalas or slopes. As per the enumeration the estimates of various works and yield of Bamboo will be made.

7.6.10.3 Method Of Working: The method of working will be as per Rules for Bamboo harvesting works of issued by then Chief Conservator of Forests (Production) M.S., Nagpur in the year 1994. Present practice of working Bamboo forest areas on three years felling cycle shall continue. The method of working will be as under.

- a. No harvesting works should be permitted from 15th June to 30th September.
- b. No clump should be considered fit for harvesting unless it contains more than 12 mature culms (one year as well as two-year-old included).
- c. It is prescribed to first mark the bamboo culms in a clump. The man-days required for marking per culm should be decided by Dy.C.F in consultation with Chief Conservator of Forests, (T) Nagpur Circle after under taking sample plot estimate.
- d. No culms below the age of two years will be felled.
- e. Following culms shall be removed from all clumps.
 - All dead, decayed and dry Bamboos.
 - Culms whose half or more top part is broken or damaged.
 - Twisted or malformed culms.
- f. In a matured clump the following type of culms (green and living) will be retained:
 - All current seasons i.e., less than one year old culms.
 - From rest of culms equal in number to the current seasons (i.e., less than one year old) culms or eight, whichever is more.
 - The remaining culms will be considered available for harvesting.
- g. The cutting height of culms will be between 15 cm to 45 cm above ground level i.e., above the first internode above the ground. The cut shall be made with a sharp instrument.
- h. In case of any flowering, no Culm from flowered clumps shall be felled in the year of flowering.

- i. Harvesting of Bamboo shall be done in a manner so as to ensure that the retained culms are evenly spaced and that some mature culms i.e. more than two years old are retained on periphery for the purpose of support to the new culms.
- j. Following acts will be strictly prohibited.
 - Digging of rhizome.
 - Lopping of Bamboo culms for fodder.
 - Use of tender Bamboo culms for bundling.
- k. Climbers affecting the growth of Bamboo clumps shall be cut.
- l. A clump will be distinguished as an independent clump where its periphery is easily discernible from the adjacent clumps, irrespective of its distance from other. Only when such a distinction is not possible, two clumps within one meter distance will be considered as one.
- m. The exposed Bamboo or rhizome on the periphery should be covered with the slash and earth to provide nourishment to spreading rhizomes and thus promoting peripheral growth of culms.
- n. Very often soft and flexible, current year culms are demanded by Burads for basket weaving, this practice is much against the silvicultural norms. This practice is injurious to the Bamboo crop; hence no immature Bamboo should be harvested.

Identification of Bamboos: Since the marking of Bamboo is highly selective, it is essential to distinguish current year or a previous year or mature culms from each other.

- a) **Current Year:** Culms sheath is present on lower half of the culms; branches are present throughout the length of the culms and white bloom is present abundantly and comes off easily.
- b) **Second Year:** Culms sheath is absent; branches are present practically at all nodes. White bloom is patchy and comes off easily.
- c) **Third Year:** Culms sheath is absent, branches are present practically at all nodes, white bloom is absent, and replaced by blackish grey.

Management of Congested, Crooked and stunted bamboo clumps: Observation from the field shows majority of the bamboo clumps are congested, crooked, and stunted in growth. The labourers while harvesting bamboo culms there is general tendency to exclude these congested and crooked bamboo clumps. A separate rate may be fixed for harvesting congested and crooked bamboo clumps by the Dy.C.F. in consultation with the Chief Conservator of Forests, (T) Nagpur Circle. The Dy.C.F should make special efforts in working the congested, crooked and stunted bamboo clumps in the coupes whichever is due

along with the regular coupe works. For sustainable harvesting of bamboo, the cross tunnel harvesting method shall be followed compared to the traditional horseshoe harvesting method.

7.6.11: Subsidiary Silvicultural Operations Cleaning and Thinning:

Cleaning Operations: All clumps will be cleaned during the coupe working. Cleaning operations in Bamboo clumps will include following elements:

- i. Climbers infesting Bamboo clumps will be removed.
- ii. All dead, decayed and dry culms will be removed.
- iii. All culms, cut high above the ground, will be cut above the first inter-node.
- iv. Twisted culms will be removed.
- ii. Top-broken culms, with more than half of the top damaged and malformed culms will be removed.

7.6.12 Regeneration: Natural regeneration should be given preference over artificial regeneration since the forest area has mixed species. The prescriptions mentioned in part 2 chapter 2.6.12 and 3.6.12 is applicable here also.

7.6.13 Associated regulations and measures

Bamboo Flowering: Flowering is either periodic (Gregarious) or annual (Sporadic). It is either gregarious, sporadic or both. Gregarious flowering is usually followed by the death of clumps, but in some cases of sporadic flowering, the clumps do not die after flowering. The details of treatment given to such an area is as given below.

Gregarious flowering: Period, extent and location of the flowering will be recorded in the divisional notebook. Extraction of Bamboo will be deferred for one year in case of the gregarious flowering. The clumps will be clear felled after seeds are mature and have been collected. Strict protection from fire and grazing will be provided for 7 years to the area where Bamboo seeds would be found viable. All Gregarious flowerings should be immediately reported to the Chief Conservator of Forests, (T) Nagpur Circle, who should issue necessary instructions for management of the flowered area. The incidence of gregarious flowering should also be brought to the notice of the Working Plan Officer, the Conservator of Forests, Research Circle and the Officers-in-charge of specialised seed units in FDCM and the Department. Seed collection, disposal of Bamboo from dried clumps after flowering and tending operations for Bamboo seedlings requires extensive planning and timely action. Very often seeds after the gregarious flowering are subjected to fungus attack and if such incidence is noticed, following treatment should be effected: The area should be sprayed with a very light solution of fungicide like Bavistin.

- i. **Treatment of Gregariously Flowered Areas:** The area of gregarious flowering must be closed to grazing and special fire protection measures must be implemented.
 - a. The Bamboo seeds falling on the ground should germinate and establish into seedlings. The resultant clump formation generally takes nearly 7 years to reach at the harvestable stage. Hence, the grazing closure should continue for 7 years in areas, where Bamboo seedlings would be found adequate.
 - b. Once the seeding is over, all the flowered clumps will be clear felled and removed in the year following the gregarious flowering
- ii. **Collection of Bamboo Seeds:** Fresh and viable seeds of Bamboo are proposed to be collected from the areas near the clumps. The seed collection should preferably be organised under the management of the specialised seed units.
- iii. **Tending Operation of Natural Crop:** The gregariously flowered areas will be tended every 3rd. Year, matching with the annual Bamboo coupes. The tending operation will cease, if the new clump foci fall below 100 per hectare, clumps become harvestable, or eight years after the Bamboo seeding.
- iv. **Bamboo Seedlings 1-3 years Old:** To induce formation of healthy clumps, evenly distributed, 250 clump foci of 70-cm diameter will be formed in the area having good Bamboo regeneration. Groups of Bamboo seedlings showing good growth will be preferred for the foci formation. Weeds, climbers and other Bamboo seedlings up to 1.50 meter around Bamboo foci should be cleared in July-August to assist growth of Bamboo seedlings in the selected foci. The entire area will strictly be protected from fire.
- v. **Beginning of the Clump Formation: 4 - 7 years old:** Immature crop will receive cleaning operations till the crop becomes harvestable. All badly grown, twisted and damaged culms will be removed from the selected foci. Weeds, climbers and other Bamboo seedlings up to 1.50 meter around Bamboo foci should be cleared, and soil working should be carried out in August. The entire area will continue to receive protection from fire and grazing.
- vi. **Mature Bamboo Crop:** Fully mature clumps may be harvested in the eighth year onward depending upon location in the annual coupe.
- vii. **Cleaning Operations:** All clumps will be cleaned during the coupe working. Cleaning operations in Bamboo clumps will include following elements:
 - a) Climbers infesting Bamboo clumps will be removed.
 - b) All dead, decayed and dry culms will be removed.

- c) All culms, cut high above the ground, will be cut above the first inter-node.
- d) Twisted culms will be removed.
- e) Top-broken culms, with more than half of the top damaged and malformed culms will be removed.

Other Regulations:

- i. **Fire Protection:** Fire causes extensive damage to the new shoots of Bamboos and, therefore, these areas must be completely protected from fire by removing all debris from the forest in the form of cleaning.
- ii. **Grazing Control:** These areas should be protected from grazing especially after flowering and in the rainy seasons in which the recruitment of new culms takes place.
- iii. **Control of Injuries Due to Insects:** The Bamboo culms damaged by the insects like, *Estigmia chinensis*, *Chrysomelidac colioptera* and *Bryotrachelus longipipes*, should be cut and burnt during winter, when these insects hibernate. The insects hide under the debris, and can be eliminated by causing light ground fire during the winter in the affected areas. Bamboos are highly susceptible to insect attack and moderately susceptible to fungal attack. They are also often attacked by *Lyctus* (powder pest beetle) and by *Dinoderus minutus*. *Dendrocalamus strictus* responds well when it is treated with a mixture of Boric Acid, Copper Sulphate, Zinc Chloride and Sodium Dichromate in a ratio of 3:1:5:6.

CHAPTER 8

WILDLIFE (OVERLAPPING) WORKING CIRCLE

8.1: WILDLIFE (OVERLAPPING) WORKING CIRCLE: The area covers the whole Division and is therefore not specifically marked on GIS based map.

8.2: GENERAL CONSTITUTION OF THE WORKING CIRCLE: This is an overlapping working circle covering the entire area of the division. This tract represents a great variety of wild animals which were depleted owing to indiscriminate shooting in the regime of jamindari.

The location of Gondia Division's forests is very important from the wild life management point of view and the said areas have already been included in the proposed Tiger Habitat and corridor management. These forests are important for corridor management between the PAs like Tadoba, Nawegaoan, Nagzira, Kanha, Pench (MP) and Pench of Maharashtra, as it provides the continuity of forests among these Protected Areas. Out of these six PAs, four are Project Tiger Project areas. For the adjoining PAs, like Nawegaon and Nagzira, these forests provide an additional space too, for the wild animals. Under the present circumstances when most of the PAs are facing the problem of corridor. The forests of Gondia Division can provide the solution to this problem, if managed properly with a futuristic approach.

Considering the importance of these forests a separate Working Circle has been included in this Working Plan. This is basically an overlapping working circle, but a few exclusive areas from the point of wildlife management are proposed to be given special protection and treatments for better management of wildlife in the areas, specially where there is a Protected Area around it. The prescriptions given in this chapter, applies to the forest area of the Division as well as to the issues relating to control the illegal trade in wild animals and animal articles in and around Gondia city. It includes the total area of the Gondia Division.

8.3: GENERAL CHARACTERISTICS OF VEGETATION: The general condition of vegetation has been prescribed in various working circles. The general condition and density of wildlife in the Division is good, however, its distribution is quite uneven. Wildlife population density varies with the habitat depending upon availability of food, water and shelter. The forest of Gondia Division is miscellaneous forest which is devoid of natural grass

land, essential for the growth of herbivores. Therefore, most of the wildlife confined to the compact forest blocks adjoining to Nagzira Sanctuary and Navegaon National Park.

A. Carnivores: (i) Tiger (*Panthera tigris*) (ii) Leopard (*Panthera pardus*) (iii) Wolf (*Canis lupus*). (iii) Striped Hyena (*Hyaena hyaena*) (iv) Wild dog (*Cuon alpinus*) (v) Jackal (*Canis aureus*) (vi) Indian Fox (*Vulpes bengalensis*) (viii) Leopard Cat (*Felis bengalensis*) (ix) Jungle Cat (*Felis chaus*). (x) Common Mongoose (*Herpestres edwardsi*).

Sighting of tiger & Leopard are in some patches of Nawegaon National park. Leopard is found in almost all the ranges. Hyena, Jackal and Foxes are found very frequently near the inhabited areas. Wild dogs are found in and around Nagzira sanctuary. Jungle cats are common.

B. Herbivores (i) Gaur (*Bos gaurus*) (ii) Nilgai (*Boselaphus tragocamelus*) (iii) Sambhar (*Cervus unicolor*) (iv) Chital (*Axis axis*) (v) Barking Deer (*Muntiacus muntjak*) (vi) Wild boar (*Sus scrofa*) (vii) Sloth bear (*Melursus ursinus*) (viii) Four horned antelope (*Tetraceros quadricornis*) (ix) Common Langurs (*Presbytis entellus*), (x) Rhesus Macaque (*Macaca mulatta*), (xi) Bonnet Macaque (*Macaca radita*).

Gaur are confined to Nagzira Sanctuary and Navegaon National Park and they can be seen in the adjoining forests of Gondia Division. Nilgai and Sambar are found in hilly ranges. Chital is found all over the tract. Wild boars are confined to hills and valleys all over the tract.

Langur and monkeys are quite common. Barking deer is found in Nawegaon National Park & Nagzira WLS & its surrounding areas.

Blue Bull (*Nilgai*) is found all over the tract. Rest of the herbivores are found mostly in the compact area. Hares are common throughout the Division.

C. Rodents: (i) Three striped palm squirrel (*Funambulus palmarum*) (ii) Jungle striped squirrel (*Funambulus sublineatus*) (iii) Porcupine (*Hystrix indica*) (iv) Hare (*Lepus ruficaudatus*) and (v) Jungle Rats and Moles.

D. Snakes: Kawda (*Lycodon aulicus*), Gavtya snake (*Macropisthodon plumbicolor*), Dhondya (*Natrix piscator*), Dhaman or Common Rat-snake (*Ptyas mucosus*), Indian Rock Python-Ajgar (*Python molurus*), India Cobra or Nag (*Naja naja*), Dandekas (*Bugarus caerulues*), Russel's Viper or Ghonus (*Vipera russelli*) and Checkered keel back (*Xenochrophis piscator*)

The rich natural setting has been responsible for rich snake population in the area, whereas Python (*Python molurus*) is commonly found deep in the forest.

E. Fishes: Besides large irrigation reservoirs, many small irrigation tanks are resources for future potential of fishery development in the district. The major catch from the riverine resources comprises local fishes e.g. Tambir (*Labeo fimbriatus*), Waghur (*Clarias batrachus*), Bodth (*Bagrius bagarius*) and Tambu (*Anguilla bengalensis*). Prawn rearing mainly of *Macrobrachium malcolmsonii*, constitutes an important fishery in the district. The prawn found in the Wainganga river & other rivers of the district is famous for its quality and taste. It is being tried in other river & tanks in the tract. The important species of fishery found in the tank and other reservoirs are Catla (*Catla catla*), Mrigal (*Cirrhina mrigala*), Botri (*Channa purctatus*), Dookkar machhi (*Nsundus nandus*), Bam (*Mastocemblus pencaulus*).

F. Wild Birds: (i) Sarus Crane (*Grus antigone*) (ii) Common sand grouse (*Pterocles exustus*) (iii) Pea fowl (*Pavo cristatus*) (iv) Grey jungle fowl (*Gallus sonne ratil*) (v) Red jungle fowl (*Gallus gallus*) (vi) Red spur fowl (*Gallus spadicea*) (vii) Painted partridges (*Francolinus pictus*) (viii) Grey partridges (*Francolinus pondicerianus*) (ix) Jungle bush quail (*Perdica asiatica*) (x) Black breasted quail (*Coturnix coronandelicus*) (xi) Indian Bustard quill (*Turnix suscitator*) (xii) Common or grey quail (*Coturnix*), (xiii) Pigeon (*Treron phoenicoptera*) (xiv) Crane (*Grus antigone*) (xv) Dove (*Streptopota spp*) (xvi) Cotton teal (*Nettapus coromandelianus*) (xvii) Whistling teal (*Dendrocugna javanica*) (xviii) Comb duck (*Sarkidiornis melanotus*), (xix) Little Grebe (*Podiceps ruficollis*) (xx) Cormorant (*Phalacrocorax carbo*) (xxi) Grey Heron (*Ardea cinera*) (xxii) Large Egret (*Ardea alba*) (xxiii) Black ibis (*Pseudibis papillos*) (xxiv) Pariah Kite (*Milvus migrans govinda*) (xxv) Shikra (*Accipiter badius*) (xxvi) India Whitebacked Vulture (*Typs bengalensis*) (xxvii) Parakeets (xxviii) Moorhen (*Gallinula chloropus*), (xxix) yellow Legged Green pigeon (*Terno phoenicoptera*) (xxx) Painted sand grouse (*Pterocles indicus*)

8.4: SPECIAL OBJECTIVES OF MANAGEMENT:

1. To ensure wildlife (animals & plants found in wild) protection and conservation in the managed forests of this Division.
2. To ensure scientific management of wildlife in the managed forests by undertaking measures like habitat management, waterhole development and monitoring population of the wild animals.
3. To provide extra space for Nagzira Wildlife Sanctuary and corridor for other P.As.
4. To ensure protection of ecologically sensitive and special habitat sites for wildlife conservation, such as riparian zones, mesic sites (natural water seepage sites), perennial water holes, natural grasslands, natural wallows, salt licks, natural resting,

breeding and nesting sites (caves snags, overhangs, groves of old Ficus trees, thick Bamboo groves).

5. To check wildlife trade and smuggling.
6. To promote and encourage ecotourism without disturbing and damaging wildlife.
7. To disseminate percept of biodiversity and wildlife conservation and generate awareness among local communities, to seek support for this cause.
8. To protect the wild animals from various diseases.
9. To provide best possible habitat to the wild animals in the forest areas to minimise the Man-Animal Conflict.
10. It would focus on present population status, minimizing conflict, steps to monitor the animals by developing a methodology to conduct census, spreading awareness and to see how joint forest management committees (JFMCs) and eco-development committees (EDCs) could be roped to avoid any man-animal conflict

8.4.1: Analysis of the Wildlife in the District:

The wildlife, which used to flourish in the forests of the division, is threatened due to various factors like population explosion, encroachments, over grazing, regular forest fires, improved network of roads and availability of sophisticated weapons. Due to increase in demand for wildlife products all over the world, poaching problems have increased over the years in and around Nagpur, which is nearby to Gondia district, special efforts are required to be made by the Division to protect the wildlife in the region.

Besides these, mammals there are many other animals belonging to amphibian, reptilian, and avian groups. Out of them many birds are migratory and visit the area in a particular season, mostly during winter. They are under great threat from poachers and (aquatic birds) fishermen.

There are many endangered insects and plants also included in the wildlife Act's schedule. They silently play a very important role in the ecology but do not get proper importance from the forest department. These lower animals and plants also need special treatment so that their viable population can survive.

Existence of Wildlife in Forest: Existence of particular wild animals in a particular forest can be identified from the following observations.

1. **By Actual Sighting:** In the early morning or evening, near water holes, grazing sites or on the roads, we can see the wild animals.

2. **Pug Marks:** By keen observation of these pug/hoof marks we can identify the category of wild animals, their sex and age.
3. **Grazing Marks:** The method of grazing of different herbivores is different. We can identify the category of herbivore by the nature of grazing and browsing.
4. **By Excreta:** By the examination of excreta we can know the category of wild life, their numbers, way of walking and, quantity of food etc.
5. **Antlers Marks (on the stem of tree):** Before falling of antlers, Spotted Deers and Sambhars rub their antler to some stem. In Spotted Deer and Sambar this habit can be observed.
6. **By Smell (odour):** Many animals having the smell glands. In Hyena these glands are found in his Anus and in case of Black Buck they are found below their eyes.
7. **By Salt Licking Places:** In forest some soil contains more percentage of salt and minerals and wild animals use to lick this soil to get the necessary amount of salt.
8. **By Sound:** In forest we can hear different types of sounds of wild animals. Some wild animals give signal of danger to other animals with the help of different sounds. For ex. Deer, Sambhar, Monkey etc.
9. **By Wallowing Sights:** Sambhar, Wild Boars etc. like mud and they wallow in mud. By this they clean their skin and protect it from insects.
10. **Nail Marks:** Tiger and Bear with the help of their Claws/nails scratch the bark of some trees.

8.4.2: Injuries to Wild Animals:

Poaching: In spite of stringent provisions in the wildlife and forest laws, poaching for skin, bones, pets and flesh, continues to be the most important reason for destruction of wildlife in the Division. Poachers usually shoot the animals when they (wild animals) come to waterholes. Therefore the animals are particularly vulnerable during summer, when number of such water holes is drastically reduced and also water in a water hole recedes to minimum.

It has been recently noticed that a new and very dangerous method of poaching through poisoning of drinking water by mixing urea in large concentration has been innovated by the poachers. When an animal drinks such water, it dies within hours due to intense gas formation in stomach and choking of breathing organs. The poachers then remove the skin or bones of the dead animal for trafficking.

Setting of nets, snares and traps for catching birds, hares and sometimes small animals like deer has been recorded in the past but of late the poachers have been found using the improvised traps for killing the large animals, like Tigers and Panthers, very effectively and regularly.

Electrocuting the animals including Tigers by laying live electric wires on the tracks followed frequently by wild animals and by drawing electric current by high tension lines passing through the forests is another new method which is proving to be a potential threat to wild animals, besides sometimes being hazardous to local people.

Degradation of Habitat: Due to various human activities the habitat of various wild animals are degrading very fast and is manifested in the form of reduced population of many animal and bird species. The main factors adversely affecting the wild habitat are:

1. Heavy biotic pressures, like over grazing, encroachments on forest lands, large scale human and cattle movement in the forest areas, forest fires etc. are responsible for the general degradation of these habitats.
2. Large scale diversion of Forest Land for projects like, irrigation dams and canals are also adversely affecting the wildlife habitat by fragmenting the forest areas and creating permanent barriers for the movement of wild animals on one hand and risk to their lives, specially for the young ones, on the other hand. The Forest department should convince the Irrigation department to construct suitable passages for wild animals at suitable regular intervals. This could have been avoided, had the DCF put the condition for these passages in the proposal of the project under Forest (Conservation) Act 1980.
3. Diseases: The livestock from the villages in the forests regularly frequent the forests and share the water holes used by wild animals. Therefore various diseases common in domestic cattle, and which spread through contact and are water borne (contagious diseases) are passed from livestock to wild animals. Most frequent is foot and mouth disease. Other diseases which may occur are (1) Anthrax (2) Rabies (3) Haemorrhagic Septicemia (4) Foot & Mouth Disease (5) Canine distemper. FMD has a potential to wipe out large populations, while rinderpest, anthrax and rabies are highly infectious and lead to certain death.

Fires: Forest fires are of common occurrence these days. The fires in the interior of the forests, besides destroying the natural habitat of the forest fauna drive them to take shelter

near the human habitation and make them easy targets of poacher's guns or local villager's weapons.

Due to fire even the young ones of big and strong animals may perish, besides other animals, reptiles and birds, who live on ground and can not escape the fire and its heat. In case if they survive, their food, grasses, herbs and shrubs are destroyed which are already insufficient to meet the requirements of cattle as well as the wild animals. The whole tract experiences water scarcity in summer. These fires aggravate the already existing water scarcity and expose these animals to above mentioned risks. It increases the man animal conflict.

8.4.3: Damages to Properties and Injuries to Human Due to Wildlife:

Damages to the Crops: Incidences of crop damages is increasing as the number of wild animals is increasing and the pressure on their grazing land is increasing due to the grazing and fire. The herbivores are coming out of the forest and damaging the agricultural fields leading to the man-animal conflict.

Injuries to Cattle and Human: The carnivores, Tigers and Panthers particularly sometimes kill domestic cattle grazing in the forests. There are also cases of human injury and even death due to attacks from wild animals. The villagers sometimes indulge in poisoning the carcass to take revenge and cases of electrocution of wild animals by the villagers to kill the animal suspected to have killed the cattle have also been reported. In such cases the persons involved in illegal killings of the wild animals do not have any intention of poaching or trade but such activities on the part of local people pose grave danger to animal populations in the forests. The Govt. of Maharashtra therefore has evolved a policy of compensating for the loss of livestock as well as for the injury or losses of human life vide Revenue & Forest Department, Government Resolution No. WLP-1094/CR-115/F-1, Mumbai dated 23rd August 2004.

8.4.4: Associated Regulations and Measures:

8.4.4.1 Recommendations for Future Management:

1. Nagzira Wildlife Sanctuary, Navegaon National Park, New Navegaon WLS & New Nagzira WLS are adjoining Gondia Division, which is exclusively managed for wildlife protection and conservation. Besides these four PA, the forests of Gondia Division falls in between Project Tiger areas like Tadoba, Pench and Kanha. In order to provide extra space and safe corridor for free movement of wildlife and to reduce the impact of biotic pressure on the Protected Areas and to conserve the special

wildlife habitat and sensitive ecological sites in the area the proper management of the forests of Gondia is extremely necessary. The improved habitat will discourage the wild animals from straying into the human habitation, thus reducing the chances man animal conflict.

2. Important areas from wildlife point of view should be identified in the division & provision for improvement and conservation of wildlife in such areas of the division, as well as for reduction of man-animal conflict, problems of poaching in the division, management of wildlife corridors, if any, should be given on top priority by DCF Gondia.
3. The location of water holes, suitable habitat for wild animals, measures needed to conserve and improve the same and anything specific and beneficial to wildlife in the Division should be taken by DCF Gondia. The areas of the division adjacent to National Parks & WLS shall be managed in consonance with objective & management prescriptions of the Management plan respective PAs in vogue from time to time.
4. Assessment of existing biodiversity in the division should be done by DCF Gondia & suitable steps to be taken for their protection & conservation.
5. Details of study & survey of wildlife corridors, eco-tourism and status of wildlife population should be done by DCF Gondia for future management for their protection & conservation. Climbers and other species included in Red Data Book of BSI and IUCN Red Data Book should not be sacrificed due to ignorance during forestry operations.
6. For better management of the Wildlife, the PCCF (Wildlife), M.S., Nagpur has issued a very comprehensive standing order and if it is followed by the field staff, most of the problems related to wild life will be solved. The DCF Gondia shall take initiative and educate all the field staff regarding this Standing Order and all the instruction shall be followed.

Local staff shall maintain record of sensitive wildlife areas such as areas with heavy wild animal concentration.

A network of information system shall be established. A cell under RFO (MS) of the Division and also under DFO (Vigilance) in the office of CCF (T) Nagpur for handling wildlife offence cases, shall be established. There shall be regular short-term training/workshops in anti-poaching activities and legal requirements in dealing with wildlife offence

cases. Forest check posts shall be sensitized for keeping a watch on wildlife offences. Any transit of wildlife articles etc. from these check posts should be scrupulously stopped.

1. Nature education programme in the villages adjoining forests and in schools and colleges shall be arranged.
2. Ecologically sensitive habitats shall be identified and protected.
3. Antler trade is now banned; hence, no collection of shed antlers is to be allowed.
4. The involvement of Honorary Wildlife Warden be encouraged for nature education programme, as well as in establishing network of informers and in eliciting people's participation.
5. It will be insured that cattle grazing in forests near the important wildlife habitats are inoculated against contagious diseases.

Creation of Data Base: It is prescribed that the Division will undertake compilation of data of floral and faunal resources, as well as ecologically sensitive sites in the Division and creates a comprehensive database for the Division.

The Division will also carry out survey of riparian zones, mesic sites, perennial water holes, saltlicks, natural wallows, resting places, breeding and nesting sites, etc. and map them (with GIS) for the purpose of their protection and management. The staff will also identify the areas where these sites are under stress and threat. The Division will also maintain a meticulous record of these sites on a register the "Register of the Special Wildlife Habitat" and update it annually by an officer not below the Range Forest Officer.

The Division will undertake census survey for estimation of the wildlife population, including the migratory and other rare birds, at the frequency decided by the Chief Conservator of Forests (Territorial); in addition to All India Tiger Estimation. Special note should be taken if any nesting site of endangered birds like Sanesang Vultures is noticed.

Delineation and Mapping of Special Habitat Areas: Delineation of the special wildlife habitat sites including natural water seepage sites (mesic sites), water holes, natural wallows and saltlicks used by the wildlife, breeding sites, dens or nesting sites of animals and birds appearing in the Schedules of the Wildlife (Protection) Act, 1972 shall be carried out and marked on the Divisional/range maps. For instance, the Mango and Jamun groves on moist sites are generally the mesic sites. A strip of 50-meter around special habitat sites shall also be delineated and mapped to serve as buffer for the site.

While preparation of treatment map of coupe for working in the area-specific working circles the special wildlife habitat sites given above shall be identified and marked on the map along with its buffer of 50 metre width strip around.

Habitat Development Works: Due to continuous biotic pressure, the wild life habitat has also deteriorated and today it has reached a critical condition. The most important factors in the habitat are water, food, safe places for resting, breeding, and nesting. Wallows and salt licks are other factors. To meet the minimum requirement of the wild animals the following activities are recommended: List of Compartments, where various habitat development works are recommended, is mentioned in the **Appendix No. XXXVII & XLV**.

A. Water Hole Development: Water availability, or the scarcity of it, is one of the major factors that decide the health of the habitat. Its non-availability at sufficient places in the forests also increases probability of animals being found on the limited water holes or near villages and thereby increases their susceptibility to poaching. Water is a major limiting factor during the summers in these forests. The water hole density shall be commensurate with the density of wild animals found in the area and as per the wildlife management regulations. To meet the requirement the following steps may be taken:

- i. All the perennial and ephemeral water holes will be identified, recorded and marked on Divisional/range maps.
- ii. De-silting, if required, shall be carried out during summer to provide adequate drinking water.
- iii. Creation of additional water holes (permanent and temporary) is prescribed so that undisturbed water holes are available within about 5 kilometres of the areas, frequented by the large herbivores.
- iv. Small nalla-bunds, underground bunds and other technically sound small water harvesting structures may be constructed across the streams to create water holes and habitat development.
- v. Small water harvesting structures with submergence area less than 1/2 hectare shall be taken up. However, creation of water holes or water harvesting structure should not damage the riparian ecosystem.
- vi. Small cement concrete saucer shaped water holes shall be constructed at suitable and safe places. These waterholes will be filled with water by Bullock carts.

The work of water hole developments should be undertaken under 7% zilla parishad grant. Division should improve the wildlife habitat in the region by taking the works as follows:

1. Repairs to anicuts.
2. Construction of Bore wells, with attached cement saucer shaped tank of 3 metre diameter.

Sometimes wild animals become dangerous to human population, due to increased population of wild life in that area; in such cases, they are to be transported to other suitable places like National Parks, Sanctuaries, dense forests etc. Keeping such aspect in mind, it is proposed to procure animal cages (both trapping as well as transport) and tranquillising gun to tranquillise the animal to put them in cage. The required fund may be allotted to the Division.

Besides these, proper video and still digital cameras should also be procured to document all wildlife related activities.

B. Food/Prey Base: Whether the prey base is adequate or not shall be ascertained from regular herbivore count. Supplements of cattle kill should be taken into account while computing existing herbivore population. Any downward trend should be looked into seriously and possible reasons for its downslide must be found out and rectifying steps must be taken.

To improve the prey base, care of herbivores should be taken by improving the assured fodder availability in the forest, specially during the summer season, when the forest grasslands are burnt. Fodder trees like Ber etc. should be protected and propagated for this purpose. The open areas in interior forest areas should be developed into meadows for the herbivores.

C. Development of Nesting Sites: Gondia Division has many water bodies, small and large and lots of water birds are found in these water-bodies. To provide suitable nesting places to these birds, seed sowing of species like Babul and plantation of species like Banyan and other Ficus species should be done near water-bodies and in the riparian areas.

D. Mitigation of Canal Induced Fragmentation of Habitat: It has been observed that very good forest areas, rich in vegetation and wild life, have been fragmented due to the construction of canals of various irrigation projects. This is highly detrimental to the wildlife conservation.

DCF Gondia will take initiative in mitigating the fragmentation of the habitat in the tract, induced by the construction of canals, with co-operation of the project agencies. DCF Gondia with the project authorities will identify the areas where passages (Bridges with natural look) can be constructed on these canals for the wild animals, so that the corridor for these animals is not obstructed and they can move and migrate freely. These works shall be appropriately designed and technically approved by both NHAI, PWD as well as the Chief Wildlife Warden of Maharashtra. DCF Gondia is also advised that, in future, while recommending any projects for diversion of forest land, proper care must be taken regarding corridor and all precautions should be taken to avoid any fragmentation of the habitat. If it is unavoidable provision of proper and safe passages for the wild animals should be included in the project at the cost of the project authorities.

8.4.4.2: Protection Measures for Wildlife:

There are many villages within and nearby the forest. They are dependent on agricultural and forestry works. These villages, with large number of live stock, are threat to the wild animals as they share the same water bodies and grazing grounds. Due to common grazing and drinking water at same places, many contagious diseases may spread in the wild animals. To protect the wild animals from such contagious diseases, forest department with the help of Veterinary doctors, should take the following preventive measures in such villages:

1. **Vaccination of Village Cattle:** All cattle of adjoining villages should be vaccinated every year for Foot and Mouth disease.
2. **Regular Health Checkup for Cattle:** Forest staff, with the help of veterinary doctor of the area, should organize annual cattle health checkup camps in villages. Required vaccination should be done and if required, proper treatment to sick animal should be given.
3. **Proper Sensitization of Staff:** The field staffs of the Division should be trained in day to day wildlife management and protection works. They should work in close cooperation with the Wildlife wing, i.e. Staff of New Nagzira WLS, Nagzira Sanctuary New Navegaon WLS and Navegaon National Park.
4. **Protection from Poaching and Trade:** The forest staff shall develop an intelligence system with the help of local people, specially with Joint Forest Management Committee, to gather information about any activities related to poachers and traders of wild life.

- Regular patrolling by the staff shall be carried out in the areas where the population of wildlife is more, specially during summer when these animals become more vulnerable due to shortage of water in the forest areas.
 - Poaching of birds is also common and it is not given due importance. The aquatic migratory birds are to be protected from the fishermen.
 - The fishery department and the local villagers should be convinced to use fishing nets of such size so that small fishes are left in the tank for these water birds.
 - The forest staff shall also be vigilant in the towns' market where at times birds like Parakeets, Partridges, Quails, Water-Birds, Monitor lizards, Tortoise, Turtles etc. are brought for sale.
5. **Protection of Forest from Over-grazing and Fire:** After poaching, uncontrolled grazing and fire are the most important factors, adversely affecting the wildlife. To restrict illegal grazing , by cattle including goat, sheep etc., and during the fire season, to prevent the forest fires, patrolling parties should carry out regular patrolling in the sensitive areas of the forest.
6. **Supply of Books:** Books, related to Wild animals disease, treatment, tranquilization, wildlife management etc. should be supplied to the field staffs to improve their management skills.

Short period training of tranquilization of wild animals, to the forest staff and Veterinary Doctors, will be given to the forest staff & Veterinary Doctors. This will facilitate safe capture and transportation of wild animals in trouble.

Transportation of Wild Animals: In case some wild animal is rescued, they should be safely transported to a safe place, without any delay, after giving it the first aid.

1. Precautions to be taken while translocation of the Wild Animals:

- Generally the transportation is done by Truck.
- The schedule of program should be prepared and should be intimated to the staff concerned.
- The cage with the trapped animal should be immediately covered so that the animal can not see out side specially the human crowd and is not scared or disturbed by people while loading, transporting and unloading.
- The crate should be kept smoothly in the truck with the help of crane.
- Before transportation wild animal should be tranquilized and should be lifted with the help of stretcher.

- Health of wild animal should be examined by a veterinary doctor before and after transportation.

2. **Material Required for Transportation:**

- Empty crate
- Nylon rope, heavy duty wire rope, iron mesh, crow bar
- Drinking Water
- Bucket, Mug
- Tarpaulin
- Stretcher
- Torch, Walkie Talkie, Mobile Phones
- Phenyl
- Other essential materials

Transportation Crates: Following 4 types of crates used for transportation of wild animals. The size of crates varies according to size of animal and nature of transportation.

- 1) **Transportation Crate:** Used for transportation. General size is length 8 feet, Width 5.5 feet, height 4.5 to 5 feet.
- 2) **Treatment Crate:** Treatment to wild animals is given in these crates. Sometimes transportation is also done in these crates. Size is according to the requirement.
- 3) **Bait Crate:** Without tranquilization or where tranquilization facility is not available, wild animals can be captured and transported in such crates. General size is Length 8 feet, width 4 feet, height 4 feet.
- 4) **Combined Transportation and Treatment Crates:** Many times wild animals gets injured while capturing in such cases, it is necessary to give them treatment before transportation.

3. **Materials Required for Tranquilization.**

Materials Required:

- Blow pipe with standard equipment
- Gas rifle model no. 50 with standard equipment (range 70 m)
- Gas pistol model no. 35 with standard equipment (range 50 m)
- Pneumatic blow pipe model 45 delta-special with equipment

Medicines for Tranquilization:

- Ketamine 100 (50 ml. x 2)
- Xylazil 100 (50 ml. x 2)
- Antagozil SA (20 ml x 10)

Marking Reservations, Other Restrictions: The following prescriptions have been made for implementation along with coupe operations and other treatment prescriptions, in the wildlife specific coupes.

1. No felling of trees or harvesting of any sort shall be allowed on these sites and in 50 metre wide buffer strips around them.
2. While marking of dead, wind fallen and malformed trees in annual coupes, 2 trees per hectare shall be kept reserved, as snags and dens to provide for nesting and resting of wildlife. No fruit tree of wildlife importance shall be marked for felling in the annual coupes.
3. While harvesting at least 2 down hollow logs, of low commercial value, per hectare shall be reserved for shelter of wildlife.
4. Tendu collection centres or labour camps shall not be allowed near water holes frequented by the large mammals or other important wildlife species. The labour camps shall be established away from areas of high wildlife density.

Development of Fodder and Browse.

1. The carrying capacity for grazing is determined after excluding the forest area required to meet fodder requirements of the wild animals and ecologically sensitive sites and special habitat sites for wildlife in the area.
2. Habitat improvement is proposed at places having high density of wildlife and the areas frequented by both domestic animals and wildlife.
3. Plantations prescribed in various working circles shall include at least 10 percent of fodder and fruit species of wildlife importance. Ficus spp. (Vad, Gular, Umbar), Ber, Anjan, etc. are recommended for this purpose.
4. In the areas falling within the FTL 2-4 metre level of major and medium irrigation projects, planting of good fodder grass shall be taken to increase the grazing facilities for the wildlife.

Annual Works and Requirement of Fund: DCF Gondia will take special care to motivate and orient the field staff in favour of Wild life through regular meetings, guidance and workshops. Some of the RFOs and Foresters shall be sent to short term training in the Wildlife Institute of India. Besides this help of trained officers and staff of wildlife Divisions may also be taken.

To start the work of habitat improvement some demonstration works and visits to wildlife areas should be carried out to expose the field staff to the technical aspects of Wildlife Management. The details proposed works and fund required for wildlife habitat improvement is given in **Appendix No. XLV**.

Other Protection Measures:

1. Special vigilance is prescribed at water holes during summer season because of vulnerability of wildlife to poaching. Anti-poaching intelligence network of the wildlife wing should be used and supplemented to prevent wildlife offences in the Division.
2. The field staff should be trained in anti-poaching activities and dealing with offence cases related to wildlife. Forest check posts should be made sensitive to the wildlife offences to check its illicit transport.
3. The areas near sensitive water holes frequented by the wildlife may be excluded from grazing, and specially mentioned in the grazing license. Inoculation of cattle grazing near sensitive wildlife habitat sites and waterholes frequented by wildlife.
4. The special wildlife habitat sites shall be effectively protected from fire, grazing and other adverse influences.
5. Removal of flower, fruit and other medicinal parts and harvesting of herbs shall not be allowed in ecologically sensitive areas. The NTFP harvesting should be watched and monitored to prevent loss of genetic material from the forest area.
6. Any person possessing a firearm and residing within 10 km of the forests will register his name with the Deputy Conservator of Forests.
7. Joint patrolling with police on the identified wildlife sensitive routes has been taken up in all the ranges.
8. There is growing trend in killing the wild animals by electrocution. Normally the farmers take electric current illegally by attaching wire to the over head line wire in the night. The animals get killed due to electric current due to tripping. MSEB officials are involved in Tiger Cell meeting. Tripping prone areas identified where vigilance is increased.

Eco-Development, Awareness Generation and Eco-Tourism: It would focus on present population status, minimizing conflict, steps to monitor the animals by developing a methodology to conduct census, spreading awareness and to see how joint forest management committees (JFMCs) and eco-development committees (EDCs) could be roped to avoid any man-animal conflict

1. Effective protection and management of sensitive ecological and special habitat sites/areas is not possible without active involvement and support of village communities in the vicinity. Their help and support can only be ensured if their genuine needs and concern are given due consideration by the department. If the people living around are poor and anguished, the objective in question can not be achieved. Thus, to seek their willing support and goodwill it is proposed to undertake eco-development works by the Division in villages around these sites. It is also proposed to promote and encourage eco- tourism in the Division by extending and developing camping and nature interpretation facilities at sites/spots, rich and unique in natural and cultural beauty and diversity. It is, in accordance with, the current policy focus of the State and Government of India on eco-tourism. The forest department should be in touch with the MTDC for the development of such sites.
2. The prominent water bodies and specific habitat sites in the Division are proposed as sites for creation of Eco-centres with facilities of nature interpretation and eco-tourism and to serve as centres for awareness generation and dissemination of issues and concerns of forestry and wildlife. The villages adjoining sensitive sites are proposed to be under eco-development programme for their overall development, eco-development plans shall be prepared with the help of local community.
It is also prescribed to delineate sacred sites/grooves and worship sites, including, sites for tribal deities with involvement of the local village communities. They are marked on the Division/range maps.
3. Archeologically important sites identified as such by the Archaeological Survey of India or the State Department of Culture shall be delineated to serve as focal sites for eco- tourism.
4. The Division will maintain record of sacred and cultural sites on a register the “Register of the Cultural Sites” and verified and update it annually by an officer not below the Range Forest Officer.

5. Awareness generation campaign should be taken up to involve local villagers in the wildlife conservation programme. Village Panchayats and JFMCs shall be involved actively to further the cause of wildlife protection.
6. Teaching institutions viz. schools, colleges, etc. and NGOs shall be involved through nature camps, wildlife film shows, exhibitions, seminars, competition, etc.

8.4.5: Sarus Crane Distribution

There are around 60 identified locations of Sarus Crane in Gondia district. Primarily all the roosting sites are paddy fields and wetlands. The local NGOs actively participate and take initiative in coordination with Forest Department for Sarus census and conservation population estimation. The Sarus Crane population estimation is shown below.

Sarus Crane Population in Gondia District	
Year	Population
June 2017	37
June 2018	35
June 2019	40-42
June 2020	45-47
June 2021	39
June 2022	36
June 2023	31

Total count method is used for the census. A scientific paper titled “**Counting birds in India: Methodologies and trends**” mentions total count method as the survey method for wetland birds.

Awareness and Sensitization

Awareness generation and sensitizing people about the importance of Sarus Crane and ecological balance would help making them conscious about the issue. Awareness campaigns with targeted audience is very powerful, because it would educate people about topics which are new to them and encourages them to participate in bringing change with regards to Sarus Crane and promoting its nesting.

Measures to be taken:

1. To educate farmers about Sarus Crane, their habitats and significance of organic farming
2. To sensitive school students about Sarus crane.
3. To sensitize local fishermen about the importance of fishing of local varieties
4. To felicitate the owners of the farm where the Sarus Cranes breed/nest.
5. Sarus Crane to be included in the People’s Biodiversity Register.

CHAPTER 9

NON TIMBER FOREST PRODUCE (OVERLAPPING) WORKING CIRCLE

9.1:NON-TIMBER FOREST PRODUCE (OVERLAPPING) WORKING CIRCLE:

The area of this Working Circle covers the whole Division and hence not specifically marked on the GIS based map.

9.2 GENERAL CONSTITUTION OF THE WORKING CIRCLE:

This is an overlapping working circle covering the entire forest area of the tract dealt with. The Non Timber Forest Produce includes both Minor Forest Produce (MFP) and the Medicinal Plants found in this tract.

Non-Timber Forest Produce (NTFP) plays a key role in the life and economy of communities living in and around forest. NTFP is mostly collected by the economically backward people living in and around forest area. The tribal people have been conserving plant and crop genetic resources as well as the knowledge on their utility. The people living in forest mostly supplement their food with Leaves, tubers, flowers and fruits all year around.

9.3: GENERAL CHARACTERISTICS OF VEGETATION:

9.3.1 Availability of Non-Timber Forest Produce in the Tract:

There are numerous minor forest produce available in this tract and are found in almost all Ranges with varying extent. This contributes a sizeable revenue to the State exchequer as well as generate employment tribals. These play an important role in rural economy.

A sizeable portion of the forests of this division are of Mixed Forest type, supporting species of great NTFP value, namely, Tendu, Moha, Biba, Char, Kane, Dhaoda, Beheda, Mowai, Khair, Salai, Aonla, hirda, behda, salai etc. These trees are found scattered in the entire division and well mixed with other species. NTFP collection generates substantial employment opportunities and supplementary income, and thereby, plays an important role in the rural economy, particularly, in the tribal villages.

The important NTFPs found and collected in this tract are Moha flowers, Moha seeds, Tendu leaves, Hirda fruits, Karu gum, Dhaoda gum, Salai gum, Dikamali gum, lac etc. The tract is rich in variety of medicinal plants which are used for curing various ailments by the

local people and therefore medicinal plants occupy an important position in the socio-cultural, spiritual and medicinal arena of local villagers/tribes. Their sustainable management and harvesting can conserve bio-diversity, sustain human and environmental health, generate employment and earn foreign exchange by promoting exports.

The special task force set up by the Planning Commission for Conservation and sustainable use of medicinal plants stressed the need for conservation and preservation of medicinal plants. The per capita annual consumption of drugs of Rs.125/- in India is the lowest in the world mainly because medicinal plants constitute the principal health care resources for the majority of the population in India. The World Health Organisation (WHO) estimated that 80% of the population of developing countries rely on traditional medicines mostly plant drugs for their primary health care needs. The modern pharmacopoeia still contains at least 25% drugs derived from plants and many others which are synthetic analogues built on prototype compounds isolated from plants. Transition from synthetic analogues built on microbial produced antibiotics to plant based drugs is rapidly gaining acceptance. Global resurgence in the use of plant based drugs is an opportunity for India to attain self-reliance and boost the export of herbal drugs. The demand on plant based therapeutics is increasing in both developing and developed countries due to the growing recognition that they are natural products, being non- narcotic, having no side-effects, easily available at affordable prices and sometimes the only source of health care available to the poor. The conservation and sustainable use of medicinal plants are issues on which immediate focus is required in the context of conserving bio-diversity and promoting and maintaining the health of local communities, besides generating productive employment for the poor with the objective of poverty alleviation in tribal and rural areas.

At present 90% collection of medicinal plants is from the wild, generating about 40 million mandays employment and since 70% of plants collections involve destructive harvesting, many plants are endangered or vulnerable or threatened. Currently medicinal plants are collected without having a complete knowledge about their maturity and use. They are also not stored properly which results in deterioration of their medical value.

For sustainable and equitable development of medicinal plants it has been realised that medicinal plants conservation areas need to be identified and field surveys and studies are required to be conducted in order to take necessary steps for their in situ conservation. The task force had also recommended the establishment of “Vanaspati Van” covering an area of about 3500 to 5000 hectares each for the intensive production of medicinal plants and their propagation which will produce quality herbal products and generate productive employment

to the local people specially women who are skilled in herbal production, collection and utilisation. These “Vanaspati Vans” can be managed under Joint Forest Management Programme for benefit sharing to altercate poverty of local people/tribals.

9.4: FELLING SERIES, CUTTING SECTIONS & JFM AREAS: Not Applicable

9.5: BLOCKS, COMPARTMENTS AND JFM AREA: Entire Forest Area of the Division.

9.6: SPECIAL OBJECTIVES OF MANAGEMENT:

As per the National Forest Policy 1988 and ‘The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act,2006’, the development of Non Timber Forest Produce (NTFP) has been one of the most important objectives in forest management. Besides this, Sustainable management of the marketable NTFPs in the division and to help to ensure reasonable returns to the local villagers especially the tribal communities are also the special objectives of management for this working circle. As per the National Forest Policy, 1988 the proper utilization of Minor Forest produce has been one of the objectives in the Forest Management. Therefore, consistent with the above policy, the special objectives of management are as follow.

- i. To manage the marketable NTFPs on sustained basis in the division and to help ensure reasonable returns to the local villagers especially the tribal communities.
- ii. To improve stocking of various NTFP species in the forest areas and enhance collection of various NTFPs by improved collection techniques.
- iii. To manage MFP and medicinal plants scientifically and to utilize the existing potential optimally and thereby to enhance the productivity and production of the same.
- iv. To get enhanced economic returns by training the local communities on value addition techniques and marketability of various NTFPs found in the division.
- v. To take measures for conservation and sustainable use of all NTFPs found in the tract.
- vi. To generate employment and improve the economy of the local people and thereby improving their socio-economic conditions.
- vii. To increase the growing stock of various non-timber forest produce species in the area.
- viii. To provide better and improved quality and culture supporting items to the local tribals.
- ix. To identify and conserve the forest areas rich in M.F.P. and medicinal plants.

9.6.1: Analysis of NTFPs:

The statutory provisions have vested ownership rights over the listed NTFPS species in the village communities in the Scheduled Areas without granting such rights over the trees and the land. Till recently, this list did not include Tendu, Apta and Bamboo, the prominent NTFP species in this tract. But after the enactment of ‘The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006’, even these forest produces have been included in the category of NTFP. Now the working plan has to be in accordance with this Act.

1. “Govt of India passed the Provisions of the Panchayat Extension to the Scheduled Areas in 1996”. In pursuance to this, Govt of Maharashtra passed Maharashtra Act No XLV of 1997, “Maharashtra Transfer of Ownership of Minor Forest Produce in the Scheduled Areas and the Maharashtra Minor Forest Produce (Regulation of Trade) (Amendment) Act 1997.”
2. As per 1997 amendment, 33 Minor Forest Produce are found on Govt. land in Scheduled Areas; ownership lies with Village Panchayat.
3. Ownership rights of NTFPs in practice have not been handed over to village Panchayat because today village Panchayat are not technically sound.
4. These 33 Minor Forest Produce are sold to Maharashtra State Co-operative, Tribal Development Corporation, authorised, vide RDD & Water Conservation Dept. GR No (Marathi) PRJ-1203/CR 366/PR-2(06) dated 11/05/2004.
5. RDD & Water Conservation Dept. GR No PRJ-201/CR 43/06 dated 21/04/2001 vide which royalty for NTFPs is required to be paid to village Panchayat by Tribal Development Corporation.
6. Wages for NTFP collection are paid to labourers by Tribal Development Corporation.

9.6.2: Other Non-Timber Forest Produce, (Excluding 33 NTFPs in Scheduled Area) and NTFPs in Non Scheduled Areas:

1. Other NTFPs excluding 33 NTFPs in Scheduled Areas and NTFPs in Non Scheduled Areas are auctioned unit wise by DCF in open auction. The amount received in the auction is Govt. revenue.
2. Units are formed for this NTFP.
3. Yield is not notified for these units.
4. Concerned contractor pays the wages for collection of NTFPs.
5. Due taxes are levied on the amount received in the auction.

6. Collection of NTFPs, processing and its auction is done by concerned unit purchase. Seventy-third Amendment of the Constitution of India has brought the NTFPS under the management of the Village Panchayat. 'The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006', has defined the NTFP, which includes all forest Produce other than Timber and firewood. This Act also recognises the rights of the indigenous peoples over the forest produce and forest land.

9.6.3: Agency for the Collection of NTFPs:

The Maharashtra Tribal Economic Condition (Improvement) Act, 1976 empowers the State Government to enforce monopoly procurement of certain goods including the NTFPs in the Tribal Sub-Plan Areas. Tribal Development Corporation (TDC) of Maharashtra, serves as the Chief Procurement Agent. This procurement provision is binding and, therefore, prescribed to be carried out, accordingly in the Schedule Areas. Procurement of NTFP should be according to 'The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006', and it's Rules.

The Government shall decide the ownership on these NTFPs and develop the mechanism of collection; value addition and disposal of this NTFPs. Year wise Revenue Obtained from various Types of NTFPs in Gondia Division have been given in the **Appendix No. XLIII & XLVI**.

The revenue realised from the gum collection is meagre and further it shows declining trend in gum availability. It will therefore be preferable to stop this auction and earmark gum collection to the FPCs under JFM. In this connection specific rules are to be framed for which necessary, proposal be moved to the Government by the division.

There may be many other forest species which yield various products or leaves, flowers, fruits etc. of such trees are of some use or the other including medicinal uses. However systematic information in this respect is not available at present. But such NTFPs should also ideally find their due place in the JFM micro-plan. Proper grading, value addition and exploring new markets for the traditional NTFPs (such as gum), shall be include under the JFM programme of the Division. The possibility of involvement of NGOs in such an endeavour should be explored.

9.6.4: Methods of Executing Treatment:

Modifications According to the Legal Provisions: Since legal provisions are not very explicit, it is recommended that Govt. of Maharashtra may notify the guidelines regarding:

1. Ownership of NTFPs,
2. Creation of a scientific data base for NTFPs and other valuable species.
3. Conservation and propagation of NTFP species
4. Improving the methods of harvesting to avoid destructive harvesting
5. Value addition and marketing of all valuable NTFPs
6. Agency for harvesting and marketing

Fire Protection Measures: Collection of NTFPs is often associated with forest fires, because the villagers set fire around the NTFP yielding trees for clearance of leaf litter and undergrowth. Fires are also caused by agents of Tendu contractors under the belief to get better flush of Tendu leaves. If it is left unattended, such fires spread into forests as forest fires.

1. The Village Panchayats and FPCs shall be involved in awareness generation programme to help control forest fires.
2. In case of forest fire, legal action should be taken against the defaulters. Strict vigilance is necessary during the months of March-April to check the spread of fires specially during the Tendu and Mahua flower season.

Training Programme for NTFP Collection: To reduce the Destructive Harvesting Techniques, training programmes and work shops for proper NTFPs collection, value addition and marketing shall be organised in each range to ensure their sustainable harvest and use. The Education Circle should prepare and oversee the training modules.

Documentation of NTFP Collection: The Beat Guard will send a monthly report to the Range Forest Officer on the quantity of NTFPs collected in their Beats, both by contractors and villagers. The Beat Guards will also maintain these records in his Beat Khairyat Report. The Range Forest Officer will compile and send the detail report, mentioning the quantity as well as the market price, to the division office. The Division office will compile the figures for each species for division with the view to monitor the collection and to improve the productivity of these NTFP to sustainable limit.

9.6.5: Non-destructive Removal of NTFP: The areas in Gondia Division, capable of producing NTFPs, should be identified and marked. Compartments having promising regeneration areas of NTFP species shall be well demarcated on the ground and on map. Unless detrimental to the wildlife conservation and site conditions, sustainable harvesting and non- destructive removal of flowers, fruits, Gums, Barks and other parts can be permitted. For

this the local villagers shall be given proper training regarding no-destructive methods of harvesting of various NTFPs. Species, which are endangered, need to be prohibited from removal. Poor class of the villagers when not engaged on agricultural works collect Mahua flowers and fruits, char, gum, honey, wax, bark, roots, leaves etc and sell them locally to supplement their meagre income. Mahua flower, Char, gum etc are sold in the weekly market at many places.

The treatment to be given will be different for different types of NTFPs, therefore, each NTFP will have separate treatment as follows.

Collection of tendu leaves begins from last week of April each year and continues up to first week of June. Quality of leaves is a major criterion for bidi manufacturers. The quality depends on the colour, texture and presence of nodules and veins. The best quality leaves are those ranging from ashy to palest hue; Almond colour is also prized shade. Leaves with leathery texture either too thick or thin are good quality for making Bidi. The leaves are collected at various collection centres called phadies. The leaves (pudas) are dried and then packed in gunny bags. The quantity is measured in standard bags.

1. Tendu leaf collection is the monopoly of the State Government under the Maharashtra Minor Forest Produce (Regulation of Trade) Act, 1969. The Tendu leaf collection shall be carried out in the manner prescribed by the Principal Chief Conservator of Forests Maharashtra State, Nagpur from time to time.
2. Tendu leaf collection is an income generating activity for most local and tribal villages in the region. The local village communities shall be gainfully engaged in Tendu collection in the Division to support their livelihood. Revenue Realized from tendu leaves collections in the last ten years in Gondia Division have been given in the **Appendix No. XLVI**.
3. A-1 type areas in working circles should be excluded from Tendu units. Tendu leaves shall not be collected from buffer area surrounding the special habitats of wildlife & in the buffer zone of national parks & wildlife sanctuary.
4. Pruning of young Tendu plants does help in increasing leaf yield. Saplings having more than 5 centimetres collar diameter shall not be pruned. However, felling of Tendu trees or branch lopping for leaf collection should be dealt with firmly.

9.6.6: Tendu Regeneration: In view of importance of Tendu to support the livelihood of forest dwelling communities and its economic value for the region, sustainable management and use of Tendu is prescribed to be given added focus.

1. Maintenance and improvement of Tendu in the forest crop composition is prescribed by ensuring regeneration of Tendu and its subsequent protection.
2. Singling of shoots and soil working around Tendu seedlings is prescribed in the plantation and rootstock areas to promote growth of Tendu seedlings along with the annual coupes in area-specific working circles.
3. Pruning should not be done yearly. It should be done at an interval of three years, during which some seedlings could establish and become the future seed bearer. Pruning should strictly and exclusively be of branches and not of seedlings irrespective of their origin.
4. It is proposed to ensure the inclusion of Tendu in mix plantations prescribed under various area-specific working circles.

9.6.7: Management of Mahua:

A. Mahua Collection: There is substantial number of Mahua trees in the forest. Inventory of Mahua trees shall be made to have an idea of its production potential and regeneration status. The villagers in the tract have local system for allocation of collection rights of Mahua flowers and fruits. In view of the viability of traditional of allocation of collection rights by the local communities no intervention is warranted in the process of Mahua collection. For better protection of Mahua trees and to increase its stock, few Mahua trees should be numbered and these trees be allotted to members of JFM committee. The members of committees who have been assigned with job of protection & nurture of Mahua trees, they should protect them from fire. Range Forest Officer is supposed to monitor this activity of JFM committee regularly and make proper documentation.

B. Mahua Regeneration: It is prescribed to provide soil working along with other planted seedlings during coupe operations of area-specific working circles. Mahua will be one of the species in mixed plantation. Seedlings of Mahua, raised during the previous season i.e. 13-14 months old, should only be planted in the mixed plantation schemes.

9.6.8: Management of Gums: Gum is an important NTFP and is exuded by plants, partly as normal phenomena and partly as the result of disease or injury to the bark. Wood Gum is a substance of more or less sticky nature.

The Karu (*Sterculia urens*), Dhaoda (*Anogeissus latifolia*), Salai (*Boswellia serrata*) and Acacia gum (*Acacia nilotica*) are main sources of gums in the area. These gums are used in medicines, chemicals, cosmetics, food industries and incense. Indian Gum, Arabic or babul gum is from *Acacia nilotica* and is of great commercial importance. The gum is used in calico printing, dyeing and as a sizing material for silk and cotton and in the manufacturing of paper.

Salai gum is mostly used in the Indian medicines for the treatment of rheumatism and nervous diseases. Salai gum has the potential of becoming mounting media by substituting imported Canada balsam in the preparation of microscopic slides. Dhaoda gum is used in food industry for making sweets. It may also be suitable in the manufacture of elastic adhesive, lacquers, oilcloth compositions, ink and perfumery. Revenue Obtained from Gum Collections in the last ten years in Gondia Division have been given in the **Appendix No. XLIII**.

Dhaoda and Salai Gum: Dhaoda trees are quite common in the forest crop of this tract. Salai trees are also found in a large number of compartments. Hence collection of Dhaoda and Salai gum is also permitted. No scientific method for tapping has been used so far in this area. For the purpose of scientific extraction of gum, the FRI Gum Tapping Rules, have been proposed for tapping of gum.

The Forest Department should collect species wise data for various types of Gums.

Tapping Rules:

1. The tapping season will commence from November to end of May each year.
2. No tree below 90 cm in girth will be tapped.
3. 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.
4. Each tree shall be tapped continuously for 3 years; and, thereafter, will be given rest for 3 years.
5. The initial blaze 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 axe having 7.5 cm wide blade. The blaze is made 0.6 cm deep in the bark.
6. Blaze may be made horizontally leaving approximately equal space between the blazes.

The blazes should not have any loose fibre. The lower surface of the blaze should be slightly slopping outwards to avoid lodging of Guggul in the blazed pocket, in case, initial blazing is done by axe.

7. The Guggul starts oozing out soon after blazes are made and may be collected initially after a month, that is, by about December when the blazes may also be freshened. Subsequent collections and freshening may be done fortnightly up to May. Overall, 12 freshening are required to be made, during the year.
8. In each freshening, the lower surface is not to be freshened. The edges may be scraped so that only 3.8 cm is increased on either side in width, at the end of 12th freshening. This means that about 0.3 cm should be scraped off from either side in width in each freshening.
9. The lowest row of blazes will be at one meter above the ground level. The next row of blazes will be made at the height of 60 cm from the lower that is, at a total height of 1.6 meter from the ground level. The vertical portion of the blaze of upper row will alternate with similar portion of the row and no two blazes of the two rows will be directly one above the other.
10. The number of blazes to be made on each tree will depend on its girth at breast height, as given in the Table No. 9.1.

Table No.9.1:- Maximum Blazes Allowed on Each Tree

Category	Girth at BH	Maximum Blazes Allowed on Each Tree
I	0.9 to 1.3 m	2
II	1.3 to 2.0 m	3
III	2.0 to 3.0 m	4
IV	Over 3 m	One blaze for each 45 cm girth in addition to the category III above.

11. No fresh blaze will be made on the partially healed up surface or old wounds.
12. Each blaze will be in a shape of parabola with a 2.5 cm wide base. The curved side of the parabola will be upwards and of height not more than 7.50 cm and the depth of the blaze will not exceed 0.6 cm in the wood.
13. At the end of the season, the height of the blaze shall not be greater than 12.50 cm. Maximum permissible dimension of each blaze shall be 10 cm x 12.5 cm x 0.6 cm in width, height and depth, respectively.
14. Since the tapping is to be done continuously for three years the total height of the blaze at the end of three years of tapping will be 37.50 cm, the width and depth remaining the same.
15. In the second cycle that is, in the 7th year (after three-year rest) new blazes will be made in the same way in the un-blazed portion, in between the blazed portions of the first cycle. This blazing will continue for another three years in the manner described

above and the operations will be repeated till un-blazed portion is fully covered.

16. In addition, tapping of trees below 90 cm GBH shall be prohibited. Collection period will be confined from November to May, to minimise the damage to the trees. The areas around the trees should be cleaned to facilitate gum collection and to prevent fire in the forests. A strict watch is necessary to enforce tapping rules and check unauthorised collection of gum. No gum producing trees should be felled. No tapping of gum should be carried out during the period of rest.
17. The agency, the organisation or the individual collecting the Dhaoda or Salai gum in violation of the prescribed tapping rules should be treated as a forest offence and dealt with accordingly.

Formation of Gum Units: The gum units for collection of Dhaoda and Salai gums are formed and well demarcated, range as a unit, they are coterminous with protection ranges which ensure effective monitoring and control.

Besides, Kane and Salai saplings are prescribed to be provided soil working along with planted seedlings in various area-specific working circles, after field inspection & their assessment. Singling and tending of Salai shoots would further help the Salai regeneration. Gum-yield species are prescribed for plantations.

9.6.9: Management of Hirda, Beheda, Amla, Char and Other NTFPS. Collection of

Hirda, Beheda, Aonla, Char and other NTFPs: Fruits of Hirda, Beheda, Aonla and Char are marketable items. Similarly, fruits, flowers and leaves of certain shrubs and trees are used for variety of purposes. Current level of collection is quite erratic and, therefore, poor indicator of their potential in the tract. Collection of species, which are not covered under the monopoly procurement by government agencies, should be allowed by the Joint Forest Management Committees or Village Panchayats for better protection of Hirda, Beheda, Aonla, Char trees and to increase its stock, few of the above trees are numbered and these trees be allotted to members of JFM committee. The members of committees who have been assigned with job of protection & nurture of above trees, they should protect them from fire. Range Forest Officer is supposed to monitor this activity of JFM committee regularly and make proper documentation. If these village bodies are not interested in collection, the collection rights may be auctioned. Collection units shall be co-terminus with the protection ranges. Removal of NTFPs shall be within the sustainable limits of production. Felling of trees and lopping of branches shall not be permitted for collection of NTFPs. Destructive removal shall not be permitted, in any case. Digging up of plant roots, branch cutting,

debarking on a plant will be considered as destructive removal.

Regeneration of Hirda, Beheda, Aonla and Char: Required tending is prescribed where saplings of Beheda, Aonla and Char are found prescribed, to remove congestion. Soil working and mulching are prescribed along with planted seedlings and to be done during coupe operations of various areas in working circles. Hirda, Beheda, Aonla and Char are prescribed for plantations. These activities should be carried out after prior inspection of the coupes or compartment by Assistant Conservator of Forests.

9.6.10: Management of Grass: The common grasses are Kusal, Bhurbhusi, Ghonad, Sheda and Marvel. Coarse grasses are used for thatching and palatable grasses for stall feeding. The demand for grass is local. For fodder Marvel, Sheda, Paunia and Mushan are preferred. Some villagers also collect Broom grass (Jhadu gavati). Broom grass may be propagated in the suitable areas. The demand for grazing is very heavy in some area of this division, aiming to provide good grazing site to the local cattle without deterioration of the productive capacity of the site.

The quantity of fodder can be improved by introducing superior grasses, legumes and fodder tree species.

9.7: ASSOCIATED REGULATION & MEASURES:

9.7.1 Future Management:

A. For building the data of NTFPS, it is proposed that weekly markets will be surveyed extensively to find out the types of NTFPs coming from forest area, their extent, purpose of utilisation, rate, chain and the agency of marketing and final destination. The local schools, village level functionaries and NGOs are proposed to be associated in building up this database.

It is proposed that the above information should be used to formulate correct prescriptions at the time of next revision.

B. To make a beginning towards NTFP cultivation, each forest guard and his van-mazoor will be given target of collecting seed material of most traded NTFPs and to propagate it as part of his beat patrolling duties.

C. The division will endeavour the following:

1. Explore possibility of developing a methodology for collection and disposal of NTFPs under the provisions of various Acts and Rules, specially “The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006’, and its Rule”

2. The Dy. Conservator of Forests, Gondia will improvise a system to develop a NTFP related data base through his field staffs and the JFMCs.
3. Each NTFP purchaser to maintain a register, in which the information like the type of NTFP; person/s who collected it; quantity, rate and place of collection (compartment); rate at which and to whom it has been sold, will be maintained.

9.7.2 Research Works: There are so many minor forest produce in the forest which are unidentified and untapped. The efforts of the department should be to explore them and manage them scientifically. The identification of medicinal plants is the field to be taken for study immediately. The help from botanists from Nagpur University/ some local expert may be taken to identify unidentified medicinal plants available in the tract.

CHAPTER 10

JOINT FOREST MANAGEMENT (OVERLAPPING) WORKING CIRCLE

10.1: JOINT FOREST MANAGEMENT (OVERLAPPING) WORKING CIRCLE:

The area of this Working Circle is 55037.566 ha.

10.2: GENERAL CONSTITUTION OF THE WORKING CIRCLE

The working circle covers 364 villages in 12 ranges. The prescriptions are applicable to area of 55037.566 ha. JFM works will be taken up in any village, if the forests belong to the category as described in the Government Resolution dated 5th October 2011 & 22nd December 2011 and local people are interested in participatory approach in Forest Protection and Management.

10.3: GENERAL CHARACTERISTICS OF VEGETATION:

10.3.1: Background of the Joint Forest Management:

The National Forest Policy 1988 envisages massive people's movement for conservation of forest resources. To this end, Government of India has advised state governments in June 1990 to involve local people in protection and development of forests in the participatory management in the shape of strategy, the Joint Forest Management (JFM). Degradation of forests is a continuing process, besides, very heavy pressure of human and live stock, population, alienation of rural communities from forest resources protection and management is an important factor responsible for degradation of forests. In the past, local communities enjoyed free access to the forests. With the bringing of forests under Govt. control & consequent, reservation of forests permitting only specified usufructory concessions, local communities were denied access to forest resources. Forest reservation policy came in conflict with the interest of local communities dependent on these forests to meet their basic needs of forest products. The forests were managed as government property in larger national interest as provided in the National Forest Policy 1952 which stated that the use of forests by village communities in their neighborhood should in no event be permitted at the cost of national interest. Such policy of managing forest only in larger national interests, overlooking the basic needs of local communities did not succeed and forests were degraded as a result of over use. Forest Department could not effectively protect the forests whose degradation continued. Forest conservation necessitated active participation of local

communities. The National Forest Policy, 1988 accordingly provided for creating a massive people who suffer the most as a result of forest degradation.

The National Forest Policy, 1988 emphasized that domestic requirements of the tribal and other poor people living within and near the forest for fuel wood, fodder, NTFP and construction timber should be the first charge on forest produce and the holders of customary rights and concession in forest areas should be motivated to identify themselves with the protection and development of forest from which they derive benefits. In pursuance to the National Forest Policy 1988, the Ministry of Environment and Forests decided to ask the State Governments to adopt the JFM system for the protection and rehabilitation of degraded forest. The Government of Maharashtra Resolution No.SIF-1091/199/F-11, dated 16th March 1992 JFM approach was adopted for degraded forest areas of this state. These guidelines were modified vide G. R. No. MSC/2000/C. No. 143/F-2, dated 25/4/2003. Recently Revenue & Forest Department has issued consolidated G.R. No. FDM-2011/CR-100/F-2, dated 5th October 2011, No. FDM-2011/CR-104/F-2, dated 25th October 2011, FDM-2011/CR-100/F-2, dated 22nd December 2011 & FDM-2012/CR-4/F-2, dated 10th July 2012, which should be strictly followed by DCF Gondia while implementing JFM scheme in Gondia Division.

JFM is a concept under which Forest Department and village committee jointly protect and manage the forest. The starting point of JFM has to be the realization of the need of JFM both by Forest Department and the local people. Generally, the scarcity of forest products such as fuel wood, fodder etc. as a result of degradation of forest on which the local communities depended, forces the people to think of steps for the protection and improvement of degraded forests. The people are usually reluctant to participate in JFM where sufficient forest areas are still available to meet their requirements. On the part of Forest Department, the problems in protecting forest without the help of local people make the Forest Department staff realize the need of JFM. The JFM program succeeds where the initiative comes from the people's side and it usually fails where it is forced from Forest department side as a government driven and target oriented program.

Villagers themselves are required to voluntarily participate in the program. Forest Protection Committee (FPC) is to be formed in each village. Each Forest Protection Committee constitutes a Managing Committee consisting of members elected from general body and ex-officio members representing concern Govt. Department at village level and with local forester as the member secretary. The managing committee is responsible to implement

the decision of general body with regard to the execution of JFM works in partnership with Forest Department Memorandum of Understanding (MOU) is signed between Forest Department and managing committee clearly specifying the duties and responsibilities of both parties. Entitlement of FPC members to the share in forest produce is subject to the fulfilment of conditions of MOU.

The members of the FPC will help in protection and development of forests and they will receive in turns of share in the usufructs as out put from the forest areas assigned to such committee. The JFM area will be managed & according to the micro plans prepared jointly by the Deputy Conservator of Forests and the member of the FPC, which will be approved by DCF Gondia. These micro plans shall contain the details of forest and village developments. This has to be sustainable, should cater to needs of local communities and the same time, the silvicultural requirements of the forest are to be made properly. Guidelines issued by Government vide G.R. No.FDM-2011/CR-100/F-2, dated 5th October 2011, FDM-2011/CR-104/F-2, dated 25th October 2011, FDM-2011/CR-100/F-2, dated 22nd December 2011 & FDM-2012/CR-4/F-2, dated 10th July 2012, which should be strictly followed while implementing JFM scheme in the division.

The program underlines conservation of forests and wildlife and therefore any activity/agreement etc. which are not in accordance with the Forest (Conservation) Act, 1980 should not be incorporated in the JFM micro plan. All JFM activities should be in conformation to the silvicultural prescriptions of the approved working plan.

10.3.2: Present Experience with the JFM in the Division:

Objective of the JFM working circle on multi pronged strategies for developing forest resources, water resources and human resources in the JFM villages, they are as follows:

1. To develop the degraded forest resources by promoting natural and artificial regeneration (through plantation activity) with active participation of the villagers. It also aims to provide effective protection.
2. To empower village communities to play a crucial role in forest resource conservation and enable them to resolve their issues and problems.
3. This JFM approach should be widely applied even at places where formal JFM committees have not been constituted.
4. JFM should be evolved on the basis of its capacity to generate sustainable employment.

10.4: SPECIAL OBJECTIVES OF MANAGEMENT:

This working circle would endeavour to generate and sustain the participatory forest management through the JFM program. This approach has shown promising results in forest protection in many parts of the country, and it is consistent with philosophy of the democratic governance. Instead of considering JFM program as a scheme, it should be considered as the approach of forest administration. Its participatory approach should be widely applied even at places, where formal JFM committees have not been constituted. After analyzing the reasons for the present deteriorated condition of these areas, it is found that non-involvement of the local people in our efforts to develop these areas is the main cause for our continuous failure. Naturally, therefore, prime objects will be to involve local people in the development of the areas. The other objects of management shall be as under.

1. To increase vegetal cover
2. To check soil erosion
3. To bring about soil and moisture conservation
4. To utilise the land for the productive purpose according to its capability.
5. And ultimately bring about the integrated development of the adjoining villages with the help of all other development agencies.

10.5: ANALYSIS OF JFM: JFM concept has been introduced in this division in the year 1998. So far 364 villages have been covered. The present status of the committee formed in this division are given in the **APPENDIX NO. LVIII.**

10.6: ASSOCIATED REGULATION & MEASURES:

10.6.1: Potential Areas for JFM:

The following area priority wise prescribes one selected for JFM program.

1. Areas prescribed under the Afforestation Working Circle are the potential areas for undertaking JFM program.
2. Areas under miscellaneous management, especially the Zudpi jungles suitable for afforestation are proposed to be covered under JFM.
3. Areas under Improvement Working Circle, Selection Cum Improvement Working Circle, are also proposed to be included in JFM.
4. Regeneration and protection of NTFP areas and collection, grading, value addition and marketability of various NTFPs in the division are proposed to be given focus for working under JFM program.

10.6.2: Area Covered and Committees Formed under FDA: The Government of India started direct funding to the circle in charge for the developmental works in the forest with the participation of the Villagers under the JFM programme. Therefore, special efforts need to be made to bring more JFMCs under this scheme.

10.6.3: Village Forests: “Village forests” or “Gram Van” means such part of reserved forests or protected forests in the village as assigned to the Village Panchayat under the Indian Forest Act, 1927 and the Village Forest Rules 2014 and also under the Maharashtra Village Panchayats Act 1959 for management through Joint Forest Management Committee. The JFMC shall manage its village forests on behalf of the Village Panchayat with due reference to the relevant provisions of the Panchayats (Extension to the Scheduled Area) Act, 1996, the Maharashtra Minor Forest Produce (Regulation of Trade) (Amendment) Act, 2006, the Indian Forest Act, 1927, the Wildlife (Protection) Act, 1972, the Biological Diversity Act, 2002, the Maharashtra Village Panchayats Act and rules made thereunder and any other law in force as applicable to the State of Maharashtra.

10.6.4: Maharashtra Village Forest Rules, 2014: In exercise of the powers conferred by sections 26, 27, 30, 32, 34 and 76 of the Indian Forests Act, 1927 (Act No. XVI of 1927), and all other powers enabling it in that behalf, the Government of Maharashtra has notified the Village Forest Rules on 13th May, 2014. The salient aspect of these rules is mentioned below:

- a) JFMCs fulfilling the criteria of Zero encroachment, Positive rate of Natural regeneration, effective control of forest fire (area burnt not more than 5 % in last three years), Over 60% survival in plantations raised in the said area at the end of fifth year, effective implementation of “charaibandi” and “kurhadbandi” are eligible for assignment of Village Forests if atleast three criteria are fulfilled.
- b) The village forests assigned to the village community or the Village Panchayat shall be managed by a committee called as the “Van Vyavasthapan Samiti” or the Village Forest Management Committee.
- c) “Van Vyavasthan Samiti” has to prepare “Ten Year Microplan” by dovetailing with the Working Plan of the landscape and, an “Annual Implementation Plan” every year for managing the village forests and place the microplan before the Gram Sabha for ratification and its approval by the ACF or Sub-DFO in charge of independent sub-division and revise it periodically.

10.6.5: General Prescriptions: JFM Micro-plans will be prepared for each village through the process of participatory rural approach. Microplans are to be dovetailed with the prescriptions of the approved Working Plan.

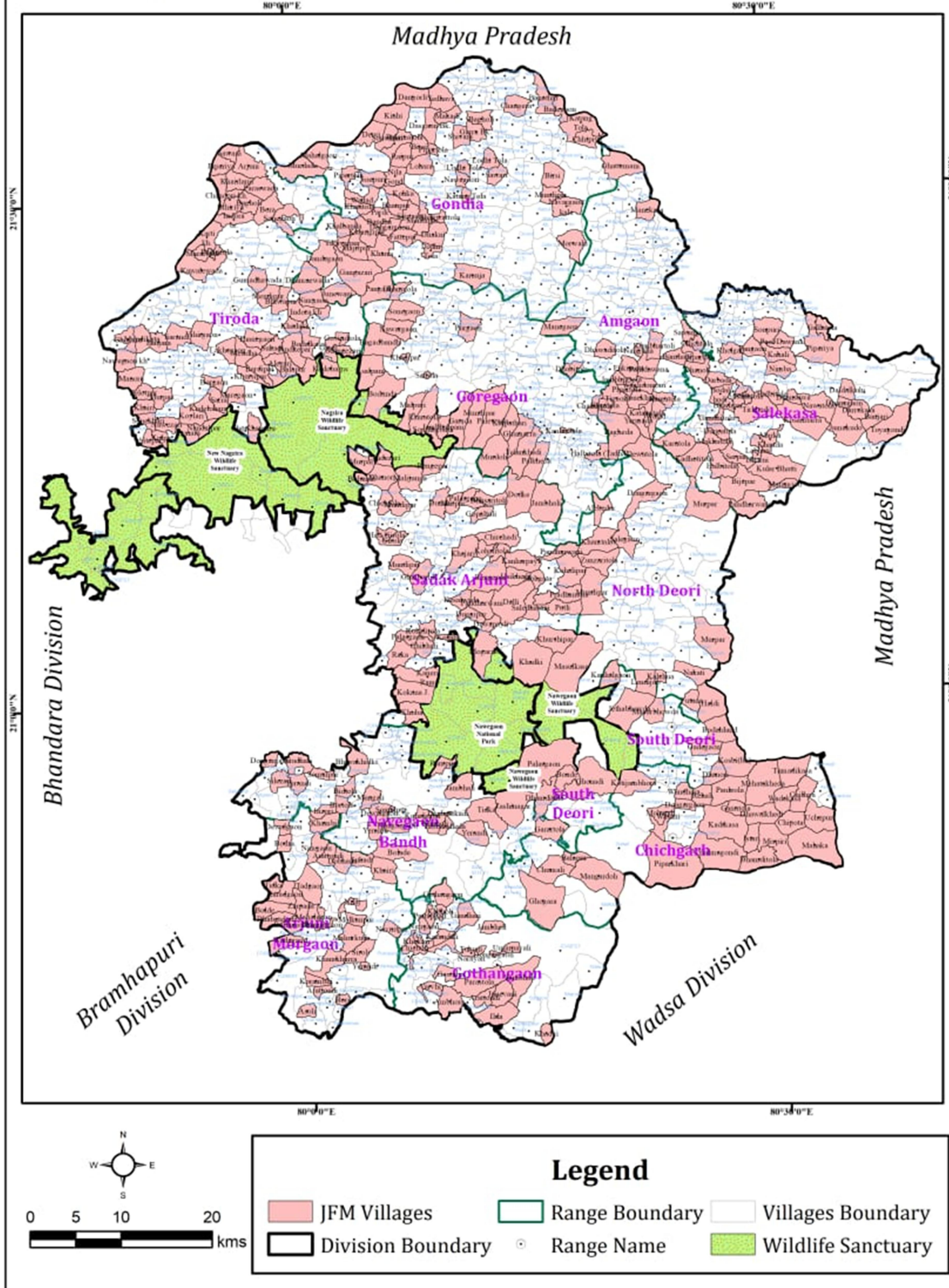
- Silvicultural management, maintenance of forest boundary, removal of forest encroachment and control over illicit cutting, illicit grazing and fire should receive high priority.
- Forest protection cannot be viewed in isolation. The works depicted in the Microplans should be reflected in the planning process of the Gram Panchayat.
- Wherever required, NGOs be involved for creating awareness programmes.
- Documentation of successful initiatives under the JFM approach must receive importance at the Range and Division level. A compilation of works undertaken in JFM villages in a financial year should be done at division level and published. This work should be given wide publicity in print and electronic media.
- JFM programme should be implemented with complete transparency. The accounts of JFMCs shall be annually audited as per Govt. instructions and a copy of such audited statement shall be shared with Gram Panchayat. All payments to JFM members shall be made either through A/c payee cheques or RTGS transfer or depositing directly into respective bank accounts. Payments through Cash shall be strictly discouraged.
- As far as possible, all works are to be executed by JFM members only. Monitoring of JFM activities by supervisory cadres (ACF to CCF) is the key for effective implementation of JFM programme. Periodic reviews at various levels will aid in good implementation.
- Often, there is thinking in the grassroots level functionaries that, JFM has to be implemented only if funds are allotted to a village. This notion is detrimental to the core values of JFM. Therefore, the supervisory officers should strive to bring suitable awareness among the grassroot functionaries (FG to RFO) to change attitudes and mindset.
- Dedicated NGOs/Civil society groups can aid the village communities in strengthening JFM institution. Their services can be utilized by the FD in areas of capacity building of JFMCs in microplanning, community motivation, eco-tourism initiatives, evolving models for enhancing livelihoods etc.

- Periodic evaluation of JFMCs should be done to identify Performers and Non-Performers. While Performing JFMCs should be rewarded, the non-Performers should be given opportunity for improvement.
- One of the important reasons for forest degradation is the dependence of local people for firewood from forests. Therefore, to reduce such dependence, GoM vide resolution of 10th July 2012 decided to distribute LPG connections to forest fringe villages. JFMC's have played a key role in implementing this scheme. In the division, 937 families spread over 61 JFM villages have benefitted from LPG connections. Efforts should be made to extend this scheme to all JFM villages.

10.7: RECOMMENDATIONS:

1. JFM Micro-plans will be prepared for each village through the process of participatory rural approach. Micro plans are linked with the working plans objective oriented site specific planning adopted for the assigned areas. Villages & watershed development planning shall be given utmost importance.
2. Silvicultural management, maintenance of forest boundary, removal of forest encroachment and control over illicit cutting, illicit grazing and fire should receive high priority.
3. Forest protection can not be viewed in isolation. The forest department may be designated as Nodal agency for all developmental works in the villages, recommended in the micro plans.
4. In carrying out the developmental activities, the expertise of NGOs has to be fully utilized.

Map Showing JFM Villages in Gondia Forest Division



CHAPTER 11

GENERAL FINANCIAL FORECAST AND FINANCIAL PLAN OF OPERATION

11.1: Revenue, expenditure and surplus/ deficit of Gondia Forest Division during last ten years is given in **Appendix no. XLIV** and details of Non-plan expenditure is given in **Appendix no. XLIX**.

11.2: SOURCE OF FUNDS FOR THE IMPLEMENTATION OF THE PLAN:

The sources of funds during the last Plan were Plan Schemes, Non-Plan schemes, CAMPA, District Plan (DPDC), MNREGA, Special Project Jalyukt Shivar, etc.

Plan Funds: From the Plan expenditure statement, as provided by the DCF, for the last 3 years average, the annual Plan funding is Rs.5864 lakh. Going by this average, the expenditure that would be required for the implementation of the Plan/Scheme needs to be enhanced.

Non Plan: The amount received by the division in the last three years under Non Plan averages approximately to Rs.698.28 lakh per year. This needs to be enhanced if the plan is to be implemented in full.

CAMPA: The CAMPA is an important source of funding. This can be increased for the core forestry operations for the implementation of the Plan.

District Plan: The District Plan funding for the upgradation of Nurseries, the development of Eco-Tourism sites, etc should be explored.

MNREGA: Labour intensive works that can be implemented through MNREGA should be thought of as this is a good source of funding. EGS, which is the original scheme started for employment guarantee as the first such scheme in the country by the Government of Maharashtra, should also be tapped into as done in the past.

NAP (FDA): The National Afforestation Program implemented all over the country with emphasis on people's participation should be made use of for the implementation of the Working Plan prescriptions.

Special Projects: State specific and District-specific projects like Jalyukt Shivar and others should be taken up for the implementation of the Plan. However, it should be noted that the implementation of such projects should be as per the Working Plan and not in

conflict with it. A point to be noted is that sometimes the DCF taking the opportunity of the funds available, takes up work on coupes not due even though such work could be carried out on the due coupes. This should be avoided.

11.3: BENEFIT COST RATIO: The benefit cost ratio for the implementation of this plan taking the figures of the Ten Years average is 1:1.723. Thus, the cost of implementing this Working Plan is expected to be more than the benefit.

This is the B.C. Ratio of only those parts of the tangible benefits that would be directly extracted as per the tables placed below.

As discussed under the Chapter 9 in Para 9.6 “Forest Resource Accounting”, if the value of the benefits of the Forest including tangible and intangible is taken into account, the amount that is being derived as benefit far far outweighs and exceeds the little investment that will be put in. The value of the benefits derived from the Forests is around Rs. 238.73 billions as per the current rate of NPV value for the Gondia Forest. If this figure of current NPV is taken for the B.C. Ratio calculation, the maths works out as under:

11.717:1 say, 12:1 as per current rate of NPV,
i.e., for every rupee that is invested the returns are twelve times.

FINANCIAL FORECAST
Estimated Annual Expenditure (details) for the Working Plan Implementation in Gondia Division.
Selection-Cum Improvement Working Circle
Expected expenditure during the plan period (Rs. in Lakh)

Sr.No.	Particulars of work	Avg. Quantum of work	unit	Man days/unit	Rate /unit (Rupees)	Annual (Rs. in lakh)	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Average (Rs.in Lakh)	
1	Demarcation and marking	2985	Ha.	4.5	2007	39.84	39.84	39.84	39.84	39.84	39.84	39.84	39.84	39.84	39.84	39.84	39.84	39.84
Coupe working																		
2	Timber harvesting	As per actual 'D' area																
3	Firewood extraction																	
4	Natural Regeneration	500	Ha.	3.5	1161	5.80	5.80	5.80	5.80	5.80	5.80	5.80	5.80	5.80	5.80	5.80	5.80	5.80
Plantation Works																		
5	PPO/PYO (Pre-planting works)	400	Ha.	130	57974.8	231.89	231.89	231.89	231.89	231.89	231.89	231.89	231.89	231.89	231.89	231.89	231.89	231.89
6	FYO(First year operations)	400	Ha	114	50839	203.35	76.25	76.25	76.25	76.25	76.25	76.25	76.25	76.25	76.25	76.25	76.25	76.25
7	SYO (Second year operations)	400	Ha.	55	24527.8	98.11	98.11	98.11	98.11	98.11	98.11	98.11	98.11	98.11	98.11	98.11	98.11	98.11
8	TYO (Third year operations)	400	Ha.	41	18284.36	73.13	73.13	73.13	73.13	73.13	73.13	73.13	73.13	73.13	73.13	73.13	73.13	73.13
9	4th YO (Fourth year operations)	400	Ha.	16	7135.36	28.54	28.54	28.54	28.54	28.54	28.54	28.54	28.54	28.54	28.54	28.54	28.54	28.54
10	5th YO (Fifth year operations)	400	Ha.	16	7135.36	28.54	28.54	28.54	28.54	28.54	28.54	28.54	28.54	28.54	28.54	28.54	28.54	28.54

11	Soil and moisture conservation works	As per site suitability but atleast 1000 ha. /year
12	Cutback operation	As per actual 'D' area

Note: -

1. The mandays approved for Demarcation & Marking is for 'D' type areas. However, mandays for 'B' type and 'C' type areas be decided by territorial Dy.CF as per crop condition.
2. Mandays for Fire Protection will be sanctioned after preparing "Fire Protection Plan" for the entire division.
3. The fund requirement will vary as per the prevailing wage rate.
4. The above items are only indicative and not exhaustive. DCF can change the quantity shown as per site requirements
5. Thinnig prescribed for Teak Plantation. Thinning guidelines given in the letter by MD, FDCM vide letter no. pln/05/F-4/2874, dated 02/09/1999 and PLN/05/F-4/ 5388, dated 02/02/2006 may be referred from Maharashtra Forest Records No. III Silviculture Book.

**Estimated Annual Expenditure (details) for the Working Plan Implementation in Gondia Division
Improvement Working Circle**

Sr. No.	Particulars of work	Arg. Quantum of work	unit	Man days/unit	Rate /unit (Rupees)	Annual (lakh Rs.)	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 7	Year 9	Year 10	Average (RS. In Lakh)
1	Demarcation and marking	1152	Ha.	4.5	2007	23.12	23.12	23.12	23.12	23.12	23.12	23.12	23.12	23.12	23.12	23.12	23.12
2	Coupe working (Hygenic Felling) D + B area																
2a	Timber harvesting	As per actual 'D' area															
2b	Firewood extraction																
3	Natural Regeneration	200	Ha.	3.5	1161	2.32	2.32	2.32	2.32	2.32	2.32	2.32	2.32	2.32	2.32	2.32	2.32
Plantation Works																	
4	PPO/FYO	150	Ha.	130	57975	86.96	86.96	86.96	86.96	86.96	86.96	86.96	86.96	86.96	86.96	86.96	86.96
5	FYO (First year operations)	150	Ha.	114	50839	76.25	76.25	76.25	76.25	76.25	76.25	76.25	76.25	76.25	76.25	76.25	76.25
6	SYO (Second year operations)	150	Ha.	55	24528	36.79	36.79	36.79	36.79	36.79	36.79	36.79	36.79	36.79	36.79	36.79	36.79
7	TYO (Third year operations)	150	Ha.	41	18284	27.42	27.42	27.42	27.42	27.42	27.42	27.42	27.42	27.42	27.42	27.42	27.42
8	4th YO (Fourth year operations)	150	Ha.	16	7135	10.70	10.70	10.70	10.70	10.70	10.70	10.70	10.70	10.70	10.70	10.70	10.70
9	5th YO (Fifth year operations)	150	Ha.	16	7135	10.70	10.70	10.70	10.70	10.70	10.70	10.70	10.70	10.70	10.70	10.70	10.70
10	Soil and moisture conservation works	As per site suitability but atleast 1000 ha. /year															
11	Cutback operation	As per actual 'D' area															

Note: -

1. The mandays approved for Demarcation & Marking is for 'D' type areas. However, mandays for 'B' type and 'C' type areas be decided by territorial Dy.CF as per crop condition.
2. Manydays for Fire Protection will be sanctioned after preparing "Fire Protection Plan" for the entire division.
3. The fund requirement will vary as per the prevailing wage rate.
4. The above items are only indicative and not exhaustive. DCF can change the quantity shown as per site requirements.
5. Thinning prescribed for Teak Plantation. Thinning guidelines given in the letter by MD, FDCM vide letter no. pln/05/F-4/2874, dated 02/09/1999 and PLN/05/F-4/ 5388, dated 02/02/2006 may be referred from Maharashtra Forest Records No. III Silviculture Book.

**Estimated Annual Expenditure (details) for the Working Plan Implementation in Gondia Division
Afforestation Working Circle**

Sr No.	Particulars of work	Arg. Quantum of work	unit	Man days/unit	Rate /unit (Rupees)	Annual (lakh Rs.)	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 7	Year 9	Year 10	Average (RS. In Lakh)	
1	Demarcation and marking	1834	Ha.	4.5	2007	36.80	36.80	36.80	36.80	36.80	36.80	36.80	36.80	36.80	36.80	36.80	36.80	36.80
2	Coupe Working (Hygenic Felling)																	
3	Timber harvesting	No felling																
4	Firewood extraction																	
Plantation																		
5	PPO/FYO	500	Ha.	130	57974.48	289.87	289.87	289.87	289.87	289.87	289.87	289.87	289.87	289.87	289.87	289.87	289.87	289.87
6	FYO (First year operations)	500	Ha.	114	50839.44	254.19	254.19	254.19	254.19	254.19	254.19	254.19	254.19	254.19	254.19	254.19	254.19	254.19
7	SYO (Second year operations)	500	Ha.	55	24527.8	122.63	122.63	122.63	122.63	122.63	122.63	122.63	122.63	122.63	122.63	122.63	122.63	122.63
8	TYO (Third year operations)	500	Ha.	41	18284.36	91.42	91.42	91.42	91.42	91.42	91.42	91.42	91.42	91.42	91.42	91.42	91.42	91.42
9	4th YO (Fourth year operations)	500	Ha.	16	7135.36	35.67	35.67	35.67	35.67	35.67	35.67	35.67	35.67	35.67	35.67	35.67	35.67	35.67
10	5th YO (Fifth year operations)	500	Ha.	16	7135.36	35.67	35.67	35.67	35.67	35.67	35.67	35.67	35.67	35.67	35.67	35.67	35.67	35.67
11	Soil and moisture conservation works	As per site suitability but atleast 1000 ha. /year																

**Estimated Annual Expenditure (details) for the Working Plan Implementation in Gondia Division
Protection Working Circle**

Sr No.	Particulars of work	Arg. Quantum of work	unit	Man days/unit	Rate /unit (Rupees)	Annual (lakh Rs.)	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 7	Year 9	Year 10	Average (RS. In Lakh)	
1	Demarcation and marking	570	Ha.	4.5	2007	11.43	11.43	11.43	11.43	11.43	11.43	11.43	11.43	11.43	11.43	11.43	11.43	11.43
2	Soil and moisture conservation works	As per site suitability but atleast 1000 ha. /year																

**Estimated Annual Expenditure (details) for the Working Plan Implementation in Gondia Division
Wild life (Overlapping) Working Circle**

Sr No.	Particulars of work	Arg. Quantum of work	unit	Man days/unit	Rate /unit (Rupees)	Annual (lakh Rs.)	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 7	Year 9	Year 10	Average (RS. In Lakh)	
1	Maintenance of Water Hole	50	Nos		200000	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
2	Habitat Improvment	25			55000	13.75	13.75	13.75	13.75	13.75	13.75	13.75	13.75	13.75	13.75	13.75	13.75	13.75
3	Fire Protection	500	Km		3800	19.00	19.00	19.00	19.00	19.00	19.00	19.00	19.00	19.00	19.00	19.00	19.00	19.00
4	Thematic training to staff	Lums um			300000	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00

**Estimated Annual Expenditure (details) for the Working Plan Implementation in Gondia Division
NTFP (Overlapping) Working Circle**

Sr No.	Particulars of work	Arg. Quantum of work	unit	Man days/unit	Rate /unit (Rupees)	Annual (lakh Rs.)	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 7	Year 9	Year 10	Average (RS. In Lakh)	
1	Training for collection method	25	Nos	-	50000	12.50	12.50	12.50	12.50	12.50	12.50	12.50	12.50	12.50	12.50	12.50	12.50	12.50

Estimated Annual Expenditure (details) for the Working Plan Implementation in Gondia Division JFM (Overlapping) Working Circle

Sr No.	Particulars of work	Arg. Quantum of work	unit	Man days/unit	Rate /unit (Rupees)	Annual (lakh Rs.)	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 7	Year 9	Year 10	Average (RS. In Lakh)	
1	Awareness Generation First Year	364	Village	-	5000	18.20	18.20	18.20	18.20	18.20	18.20	18.20	18.20	18.20	18.20	18.20	18.20	18.20
2	Micro Plan Prepration	36	Village	-	15000	5.40	5.40	5.40	5.40	5.40	5.40	5.40	5.40	5.40	5.40	5.40	5.40	5.40

**Estimated Annual Expenditure (details) for the Working Plan Implementation in Gondia Division
Bamboo (Overlapping) Working Circle**

Sr No.	Particulars of work	Arg. Quantum of work	unit	Man days/ unit	Rate /unit (Rupees)	Annual (lakh Rs.)	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 7	Year 9	Year 10	Average (RS. In Lakh)	
1	Demarcation & marking																	
2	Bamboo Harvesting																	
3	Cleaning																	
4	Fire Protection																	
As per actual area of working																		

**Estimated Annual Expenditure (details) for the Working Plan Implementation in Gondia Division
Boundary Maintenance**

Sr No.	Particulars of work	Arg. Quantum of work	unit	Man days/ unit	Rate /unit (Rupees)	Annual (lakh Rs.)	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 7	Year 9	Year 10	Average (RS. In Lakh)	
1	Fixing of boundry pillers in RF	1000	Pillars															
2	Fixing of boundry pillers in PF	5000	Pillars															
3	New demarcation of zudpi jangle/Uncl ased Forest	2000 ha/year	Ha															
As per new boundary demarcation scheme and site suitability																		

CHAPTER 12

MISCELLANEOUS REGULATIONS

12.1 PETTY FELLING AND EXTRACTION

Petty Felling and extraction for research and training needs should be allowed. It is necessary to emphasize the fact that experimental, preservation and sample plot, seed stand and their demarcated surrounds, etc. are excluded from all operations prescribed in the working plan. Special grants in exceptional circumstances for maintenance of these may be allowed, which do not cause much deviation.

12.2 RIGHTS AND CONCESSIONS

Govt. of India passed the Provisions of the Panchayat (Extension to the Scheduled Areas) act in 1996". In pursuance to this, Govt. of Maharashtra passed Maharashtra Act No XLV of 1997, "Maharashtra Transfer of Ownership of Minor Forest Produce in the Scheduled Areas and the Maharashtra Minor Forest Produce (Regulation of Trade) (Amendment) Act 1997 vide which ownership of 33 MFP specified in the scheduled, found in the Govt. land has been transferred to the Panchayats. The Hon'ble Governor of Maharashtra had modified the existing act and has given ownership of all MFP to gram sabha vide notification dated 19.07.2014.

There are some burad communities in the division, whose livelihood depends on bamboo. The department distributes bamboo to these communities and also they acquire from nearby forest areas. There is no sizable population of grazing community in the District. However livelihood of local community depends upon forest for grazing their cattle. The range wise grazing units are formed and every year the grazing passes are issued to the local community people for grazing purpose.

12.3 MARKING OF TREES FOR HARVESTING:

1. After approval of treatment map, marking of trees for harvesting shall be carried out as per the prescriptions given in respective working circles. Marking of trees for harvesting shall be done one year in advance of the coupe working and it shall be done departmentally. Timely marking would facilitate necessary checking and corrections, if any, in time.

2. Marking is prescribed to be done by the forester concerned under the close supervision of RFO and constant guidance of ACF concerned. The DCF shall himself inspect majority of the coupes to ascertain proper marking as per prescriptions of the working plan as well as to guard against the excessive marking. To ensure this close supervision, a marking certificate in following format is prescribed.

Form

I,RFO, personally inspected the marking of the coupe No. in the compartment No of felling series in Working circle on .../...../..... and found that marking of trees for felling has been done as prescribed in the working plan.

Date:

Name, Signature
and official seal of the RFO

These certificates shall be regularly and frequently checked and verified by the ACFs as well as the Deputy Conservator of Forests.

3. Trees marked for felling will be given *geru bands* at breast height and will bear marking hammer impression at the B H (breast height) as well as at the base on the blazes of sizes 10 cm x 10 cm.
4. Following trees in addition will bear digit serial numbers both at BH (Breast Height) and at the base.
 - a) All trees of Teak, Bija, Shisham, Ain, Tiwas, Haldu, Kalam, Dhaoda and Shiwan of 45 cm and above, girth at b.h (o.b).
 - b) Trees of all other species, of and above, 60 cm girth at b.h.
5. The remaining trees marked will bear serial numbers, which will be given by coal tar. The digit and coal tar serial numbers will form separate series.
6. The number of the tree marked shall be written vertically on the blaze, shown as under:

Table No. 12.1 Nail Marking:

For Tree no. 210	XX (Hammer mark)
	2
	1
	0

7. All trees bearing serial numbers will be individually recorded in marking (recording) book in, the following, Form No 19.3. Serial number given in coal tar must be recorded in the marking book.

Table.No.12.2 Format for Marking of Trees for Harvesting

Sr.No.	Tree No. Digit No.	Serial No. In Coal tar	Name of species	GBH(OB)	Remarks

8. Abstract of trees marked for felling will be made in 15 cm girth classes. Timber, poles and firewood trees will be shown, separately.
9. Malformed trees alone will be recorded as fuel trees, except that of Teak. A tree will be classified as fuel tree only when it is incapable of yielding any useful sawn timber or pole.

12.4 SOIL AND MOISTURE CONSERVATION WORKS: This operation should be carried out in accordance with the ‘Watershed Development Principles’ and Guidelines of the Government. The local people should also be encouraged and motivated for Participatory Management of Water Resource.

The Soil and Moisture Conservation Works would start along with the marking of coupe and be completed before the onset of monsoon. Wherever feasible, the local material obtained from climber cutting, and shrub clearance shall be used for brushwood check dams to arrest the soil loss.

It is prescribed to follow watershed management approach viz. the Ridge-to-Valley approach for carrying out soil and moisture conservation works. The contour trenching and gully plugging/check dams, as given under, have been prescribed to constitute the major component of these works.

Contour Trenching: Contour Trenching as soil conservation measure could be taken in suitable places only with due precautions. The estimates should be examined and sanctioned by the C.C.F Nagpur. Unnecessary digging of such trenches, only to meet the financial target or to provide employment to EGS labours should be avoided.

The contour trenching is prescribed in areas having density less than 0.4 and slope below 25°. The size of the trench is prescribed as 30 cm deep and 45 cm wide. Dug up soil from the trenches will form a ridge on the downhill side, and pebbly material from the trench

will be neatly pitched on the lower side. *Agave* Bulbils, Khus tussocks and seeds of other suitable soil binding species will be planted on the mound at one-meter interval in two staggered rows set 20 centimetres apart on the downhill side. The mound will also have sowing of seeds of Khair, Babul and Neem, etc. Chilati seeds may be preferred on refractory sites.

Trenches near the nalas are prescribed to be discontinued and curved upward at both sides of the nalas at 45⁰ to prevent the run off of water stored. Contour trenches will normally be not more than 10 meter in length, and two contour trenches will be spaced at least 5 meter apart (horizontal distance).

The quantum limit of contour trenches is prescribed to be not exceeding 300 running meter per hectare in the B-type areas, and 100 running meters per hectare in the C-type and the D-type areas.

Nala-Bund and Check-Dams: The primary objective of nala- bunding and check dams are to reduce the run off of water and to arrest the silt. They are prescribed to be made from the loose boulders found in and around the nala beds or from the dug-up soil. No blasting or quarrying shall be done for this purpose. Where sufficient boulders are not available brushwood may be used. In this plan, check dams of both the loose rubble for arresting silt & soil loss and earthen gully plugging (nala bunds) for moisture conservation and water harvesting are prescribed.

- a. The structure and quantum of work will depend upon various factors such as the erosion status, ground conditions and local availability of suitable materials. However, to narrow the wide variations in implementation, the norm for gully plugging or nalabunding is proposed as 5 m³/hectare of loose rubble filling or earthwork unless otherwise prescribed in the specific scheme or on special reasons the C.C.F Nagpur gives permission to increase the per ha. volume of the bunds.
- b. The streambeds more than 7 meters in width shall not be covered under the nalabunding. Nalas more than 7-meter-wide at the top should normally require elaborate engineering structures for bunding, and therefore, such bunds should not be considered as part of the quantity prescribed here. Each of such nala bunds, if required, should be treated as an independent project.
- c. The Forest Tanks (not more than 1 ha. submergence area) are proposed to be taken up in exceptional circumstances without causing damage to the tree crop will prove basically

helpful for water conservation and availability of water for wild animals only and not for the use by the cattle and villagers.

Monitoring of Soil and Moisture Conservation Works: Considering the amounts of fund being spent on Soil and Moisture Conservation Works, a proper monitoring is required to study and record the effects of these works in the field. The D.C.F with the help of the competent authority of Soil Conservation, in the Agriculture Department, will monitor the effects of these works and will develop a proper record of the activity and its effects on the Soil, Soil moisture, vegetation and wildlife habitat. The future planning will depend upon the assessment results of the Soil and Moisture Conservation Works carried out by the division during the implementation period of this Plan.

12.5 GUIDELINES FOR REGENERATION: Regeneration process is extremely important to restore the health and overall productivity of the forest. The regeneration may be either natural or artificial. The RFOs should prepare the Grid-based (100 mt. grids) treatment maps on the scale 1:5000, under the supervision of the ACFs. All the operations of Artificial Regeneration and Natural Regeneration should also be Grid oriented (50mX50m) with clear base lines and reference points, on the ground. The Natural Regeneration should be given preference over the artificial one. Among Natural Regeneration, the Regeneration of Seed Origin will be given preference over the Coppice Origin according to the importance of the species. A proper record, in the form of Register, will be maintained at Range level as well as Division level regarding all activities of Regeneration. All entries will also be made in the relevant Coupe Control Forms and Compartment History Forms.

In case of Artificial Regeneration, proper Plantation Registers shall be maintained at Range as well as Division levels.

Natural Regeneration Management:

- i. Tending of Natural Regeneration of Seed Origin:** All seedlings and saplings (of seed origin) of valuable species, more than 60 centimetres in height, will be nursed as future crop. Spacing out operations, if required, will be carried out to leave nearly 400 saplings per hectare at an average of 5 metre spacing. While doing so (species like, Bija, Shisham, Haldu and Tiwas etc.) which are less in number in stocking and NTFP species shall however be given preference for retention. The natural regeneration shall be assisted and encouraged by soil working and mulching around them, in the following manner.

- **First year Operations:** Weeds in one-meter diameter around saplings of valuable species should be cleared during the first week of July. Uprooted weed, grasses and leaf-litter should be mixed in the upper layer of soil as the organic mulch and facilitate loosening and aeration of the soil by worms and insects. One soil working should be carried out in October.
- **Second year Operations:** The soil working in October will be repeated in the following year. However, one scrape weeding of one-meter diameter should be carried out in the first week of August around the shoots of seedling coppice within the rootstock management area.
- **Third year operations:** Singling of coppice shoots, management of damaged and malformed saplings, climber cutting and shrub clearance should be repeated as third year operations.

ii. Root Stock and Coppice Management: In the areas where there are no sufficient seedlings of seed origin, (at least 400-500 healthy and established saplings) are found the existing root stock shall be managed to increase the density and productivity of the crop. Preference will be given to encourage the valuable species of choice of the areas and will be managed accordingly. Tending of root stock (Valuable spp.) in the B-1 type will be carried out as following:

- **Singling of Coppice Shoots:** One healthy and promising coppice shoot will be retained on the stumps and the rest be removed. However, coppice shoots interfering with promising saplings of seed origin shall be removed. Such coppice shoots should also be close enough to the ground so that it will not topple after gaining volume and weight and would be able to develop root system of its own subsequently.
- **Coppice Management of Damaged and Malformed Saplings:** The saplings and poles of up to 45 cm girth having one third of the stem damaged and malformed shall be coppiced by cutting flush to the ground. Such coppicing, however, should not expose the ground, causing erosion and leading to soil loss. Poles having at least 2.50 meter of clean bole will not be treated as malformed.

Artificial Regeneration: It has been observed that the soil depth in some areas, covered under plantation programme in the Division, is shallow and therefore the efforts made in the past in raising plantations (particularly the miscellaneous plantations) have resulted in

failures. Hence, the plantations should be taken up on selective basis and only in the areas having good soil depth and which are well drained. Also, the areas selected should have no or negligible grazing pressure. If the area was already planted and resulted in failure, such sites should be avoided. B2 type areas in the various working circles i.e., the under-stocked areas with scanty natural regeneration, are prescribed to be considered but such areas shall specifically be put to above tests before taking up plantation there. Only the areas neither having sufficient seedlings/ saplings of seed origin nor sufficient root stock but are found to be suitable for plantation of miscellaneous species shall be covered under the plantation programme.

Areas having adequate regeneration from rootstock and of seed origin will be tended as described for the Natural Regeneration Management. PPO/PYO (pre-planting operations) shall be taken up in the fourth year of coupe working, while the seedling planting and other FYO (first year operations) activities shall be carried out in the following year, that is, the fifth year of coupe working. Other plantation works will follow in the sequence. The cleaning and thinning operations in plantations will be done in the fifth and tenth year of plantations. Plantations in the remaining working circles will be taken up in the single stage. The required field staff shall be provided with Plantation Targets, as per the norm and the target should not exceed the fixed norm for staff and officers at different levels.

Planting Operation in SCI & IWC Working Circles: In the coupes of SCI and IWC working circles the pre-monsoon works shall be carried out after completion of coupe working. The SMC works will be carried out with the work of demarcation and marking of the coupe and will be completed by the onset of monsoon. The PPO/PYO (pre-planting operations) shall be taken up in the following year of coupe working, while the seedling planting and other FYO (first year operations) activities shall be carried out in the second year of coupe working. Other subsequent plantation works will follow in the sequence. The cleaning and thinning operations in plantations will be done in the sixth and eleventh year of plantations respectively.

- **Planting Operations in Afforestation Working Circle:** Since these coupes do not have the work of timber harvesting, the plantation operations shall be one year in advance as compared to SCI and IWC Working Circles. Demarcation and SMC works will be carried out with the SCI & IWC coupes. Next year after carrying out felling, whatever little is required, the PPO/PYO will be carried out. The planting operation will be carried out in

the next rains and the subsequent operations will be carried out accordingly. Cleaning and thinning will be carried out in 6th and 11th year of planting respectively.

Seed Sowing and Stakes Planting: In areas where seed sowing and stake planting are prescribed, the work has to be carried out by the beat guards and Van Majur working under him. The following steps will be followed for seed sowing operation:

- The RFO concerned, in consultation with the ACF, will decide the species of seeds to be sown.
- The RFO will identify the healthy source of the seed and get the seed collected by the Forest Guards and Van Mazdoors.
- Seed of unknown sources should not be used.
- The seeds should be sown at the appropriate places before onset of monsoon i.e. in the second half of May.
- The seeds will be sown under some bush by making the soil loose with the help of planting bar, 1-1.25 mt. long obliquely cut pointed iron pipe of ½ or ¾th inch in diameter.
- Waste small cut cloth pieces of bright colour, collected from tailors' shop, should be tied on the bush under which the seed has been sown to verify the germination of the seed after the rains.
- Proper records like Compartment no., species, quantity of seed sown, date of sowing etc. will be maintained in a Seed Sowing Register and the respective Compartment History Form at range level.
- Subsequently the number of germinated seedlings will be recorded in the register.

The stakes of Ficus and other suitable species will be planted at a distance of 6 m, along nala sides and other moist areas after onset of monsoon. This work will also be carried out by the Forest Guards and Van Mazdoors and entries will be made in the seed sowing register.

Seeds and Planting Stocks: Planning for plantation shall be done in advance so that good quality seeds can be collected and healthy seedlings can be raised in the nurseries. Plantations mainly depend upon the quality of seeds and planting stocks, it is therefore very important

that all necessary precautions should be taken to get the best quality seeds and best planting stocks i.e., Teak stumps, seedlings of misc. spp. and Bamboo for artificial regeneration.

- **Seeds:** Seeds used for artificial regenerations must be of high quality and from known sources. The D.C.F should take all precautions that the best quality seeds are collected for raising the planting stocks.
- **Teak Stumps and Seedlings of Miscellaneous spp:** The planting stocks either Teak stumps or seedlings of miscellaneous species should be raised timely and only the best stocks should be transported to the planting sites to avoid planting of inferior stocks. The ACFs should supervise the sorting and transportation of planting stocks and all plantation operations under the direct supervision of the D.C.F.
- **Planting Stock of Bamboo:** The seed collected for plantation must be from known clumps so that the quality and species are known. Seeds should be sown in the bed and these rhizomes should be shifted in the beds, at least twice. After one year one single healthy rhizome should be transplanted in to the poly bags of suitable size. Two years old rhizomes should be planted in the site. Special care should be taken that the seeds are of known species of Bamboo. Regular cutting of shoots should be carried out to get well developed rhizomes.
- **Planting Stocks for Species with Short Lived Seeds and Slow Growing species:** Planting stocks of species like Mahua, Tendu, Hirda Karanj, Bija and Anjan should be raised one year in advance i.e., the seedlings of two monsoons old should be planted.

Choice of Species: Valuable local species suitable for the site and favoured by the local village communities will be preferred in plantations. Teak, Shisham, Khair, Shiwan, Siras, Chichwa, Aonla, Chinch, Neem, Kullu, Mahua and Sitaphal should be considered among the recommended species. Neem, Khair, Aonla, Chinch, Chichwa, Karanj, Siras and Sitaphal may be preferred in areas close to habitation. *Dalbergia sissoo* (Sissoo) is not local specie, but may be used on suitable alluvial soil. Seedlings of edible fruit-yielding forest species and other important NTFPs like Kullu, may constitute up to 20 percent and seedlings of medicinal plants up to 5 percent of the planting stock. Stakes or tall planting of suitable species, such as, Ficus, Umber, Ber, Anjan, Babul etc. useful to wildlife are also proposed in plantations, up to 10 percent of planting stock. An officer not below the rank of Assistant Conservator of

Forests should approve the final choice of species and source nurseries in consultation with the D.C.F.

Spacing in Plantations:

- Teak stumps from root-shoot cuttings should be planted on well-drained and suitably open sites only at two meter spacing (2x2-meter spacing). Teak seedlings raised in poly-pots or root trainer containers can be used in special cases only after duly recording the reasons in the prescribed register. Mixed species plantations should be carried out at two-meter interval (2x2-meter spacing) in 30cm X 30cm X 30cm pits.
- Bamboo and some NTFP seedlings like Hirda, Mahua etc, should be planted at six-meter spacing (6 X 6-meter) in 45 cm X 45 cm X 45 cm pits. Care should be taken to avoid planting of seedlings directly under the canopy of existing trees or established saplings.
- Grass plantation will be taken in 37 beds/ha of 1 m X 7m X 0.15 m. dimensions whereas, the fodder trees will be planted at 10m X 10 m spacing in pits of 30 cm X 30 cm X 30cm.

Fencing of Plantations: The plantation areas or the rootstock management areas are prescribed to be fenced effectively to protect it from grazing. The fence can be (a) Traditional Fencings like TCM (Trench-cum-mound), Live-hedge fencing or suitable mechanical fencing or more effective (b) Social Fencing, with the help of the villagers. The villagers through the JFM committees should be encouraged for the protection by sharing the expenditure of fencing with the JFM Committees. In case the social fencing does not materialise then the following traditional methods may be tried:

- TCM (Trench-cum-mound) of the standard cross section, one-meter deep and 1.90(On top) and 0.60 meter (Bottom) wide at top and bottom respectively is prescribed. Across the slope, however, rubble wall is proposed in place of TCM.
- Boundaries of the plantation areas or the rootstock management areas running across the contour or artificial boundaries inside the compartment are prescribed to have live hedge fencing on 1.20-meter-wide ridge of worked up soil. Two rows of *Agave* will be planted at the outer edges along with seed sowing of Chilati, Babul, Jatropha, Bamboo and other local thorny species immediately after onset of the monsoon.

- The mechanical fencing, if found financially viable, may be used in areas prone to heavy biotic pressure, if the situation so demands. Justification for use of mechanical fencing should be recorded in the prescribed plantation register.

Pit Digging: Pits of size, preferably, 30-cm³ for planting seedlings of non-Teak miscellaneous species and 45-cm³ sides for Bamboo and NTFP Spp. like Mahua, Hirda etc., are prescribed. The dug-up soil will be kept on the upper side of the slope, and allowed to weather from March to the first week of May. Pit refilling must be completed before the onset of monsoon. Pits for Bamboo planting shall be half filled during the refilling using topsoil from the heap.

Planting:

- i. Planting of Teak Stumps:** Crowbar planting of Teak stumps must be carried out within one week after the first monsoon shower.
- ii. Poly-pot or Root-trainer Planting:** Seedling planting must be completed within a fortnight after the first monsoon shower.
- iii. Bamboo Planting:** Bamboo planting must be completed within a fortnight after the first monsoon shower. Preferably, two-year-old Bamboo seedlings with well-developed rhizomes should be planted. If stone mulching is feasible in the area, the pit should be refilled up to the ground. Otherwise, the ball of the earth and rhizome of the seedling should just be covered with soil and almost half of the pits should be left unfilled for reducing wild boar damage. In case the Bamboo plantation is to be taken in a planted area, it should only be taken in the sixth year on ward so that the mixed or Teak plantations are not suppressed and the watch and ward of the planted area will be extended to 10 years (5 years for each plantation scheme).

Subsequent Planting Operations: It is common in the field that all attention is paid only to the current year plantations and in the process of PPO/PYO the old plantations are neglected. The work of casualty replacement, weeding and soil working are neglected and not carried out properly and timely. The protection of old plantations from fire and grazing are also neglected. This leads to big losses in the form of failed plantations. To avoid this, D.C.F should fix the responsibility on Beat guards, Round Officers, RFOs and ACFs to inspect the old plantations regularly and see to it that all prescriptions are implemented and all steps are taken to protect it from any damage. The ACFs should supervise these works very closely and give a certificate in the first week of November that all due operations have been carried out properly and timely in all the plantations up to 5 year of age.

A. First Year Operations: All weeding and soil working should be carried out in a circle of one-meter diameter around the seedlings or saplings. The first scrape weeding should be started immediately after completion of the entire plantation and appearance of weed growth. Casualty replacement should be done along with the first weeding in July. The second scrape weeding should be done in the last week of August. The soil working and mulching should be done in the first week of October. In case of, prolonged hot and dry season, it is desirable to carry out one soil working in the month of January.

B. First Year Operations in Bamboo Plantations: The first weeding, casualty replacement and the second weeding should be carried out as described in the preceding paragraph. Stone mulching should also be carried out with the second weeding in Bamboo plantations as a safeguard against the wild boar damage. The third weeding and soil working operations are not required in the Bamboo plantation.

C. Second Year Operations: In the second year of plantation, casualty replacement should be done in the planting season. The first scrape weeding should be carried out in the first week of August, and the soil working and mulching should be done in early October. The first and second weeding should also be carried out around the seedling coppice in the plantation area.

D. Second Year Operations in Bamboo Plantations: The first weeding should be done in the first week of August, and it should include maintenance of the stone mulching in the Bamboo plantations.

E. Third Year Operations: One weeding in the third year should be done along with the soil mulching in September. Singling of coppice shoots, management of damaged and malformed saplings, climber cutting and shrub clearance should be repeated as third year operations.

F. Periodic Appraisal of Regeneration by Staff: The regeneration of the species in the forest area should be monitored in 2 years periodically, by territorial Division and their findings are sent to Working Plan Division.

12.6: PROCEDURE FOR THINNING:

Thinning guidelines given in the letter by MD, FDCM vide letter no. pln/05/F-4/2874, dated 02/09/1999 and PLN/05/F-4/ 5388, dated 02/02/2006 may be referred from Maharashtra Forest Records No. III Silviculture Book.

12.7 ROADS, CART TRACKS AND CULVERTS:

The forest areas of the Division have a good network of roads and cart tracks. The Public Works Department of the state government or the Zilla Parishad maintains large number of roads passing through the forest area. Some stretches have been permanently transferred to the Department. The Division should compile comprehensive records for all roads passing through the forest area and the roads transferred to the Division for maintenance, on priority basis. The extent of forestry operations and gravity of forest protection concerns should determine the priority for maintenance of the forest roads. Unwarranted up-gradation of the forest roads should be discouraged, but required culverts may be constructed in stretches useful for the forest protection

12.8 HARVESTING AND DISPOSAL:

Agency for Harvesting: The Deputy Conservator of Forests, Gondia shall decide the agency for harvesting in accordance with the applicable policies and regulations. Present policy prohibits the sale of standing trees. Regarding NTFP, the disposal should be according to the Acts and Rules, defining the NTFPs and right of ownership over them.

Disposal at Timber Depots: Harvested timber and firewood are prescribed to be transported to the established forest depots for sale by auction or allocation according to the prevailing policies and guidelines. The National Forest Policy, 1988 acknowledges the first charge on the forest produce in the local tribal and village community living in and around the forest areas. Hence, decision for the disposal of the forest produce should be guided by the philosophy of the first right of the local village communities, which is also recognised in the Nistar-Patraks. For facilitating Nistar distribution, temporary depots can be created at the Range Headquarters, in addition to beat and round headquarters.

Stacking for the Nistar Supply: Each established or temporary depots is prescribed to have designated areas for stacking small timber, poles, firewood and Bamboo for the Nistar supply at the sanctioned rates to local people including agriculturists and artisans. The Deputy Conservator of Forests can approve additional Nistar depots at suitable places in the Division, so that villagers may not be required to traverse large distance to procure the Nistar materials. The Deputy Conservator of Forests in consultation with the District Collector fixes the Nistar rate. Supplies of small timber, firewood etc. as well as the forest produce required for occupational Nistar will be governed by Nistar Patrak of each village. Availability of the

Nistar material will to be informed to the Taluka Panchayats and the material left unused for three months will be sold through open auction.

Irregular Harvesting:

Restriction on Irregular Harvesting: Irregular harvesting of timber, firewood, Bamboo and other NTFPs is prohibited, except in the following cases:

Harvesting for the Fire Lines and the Transmission Lines: The Deputy Conservator of Forests may permit felling of herbs, shrubs, thorny bushes, within the prescribed width of the established fire lines and the approved power transmission line. The prescribed width in the guidelines for the Forest Conservation Act 1980 and rules, there under, will be applicable to the transmission lines.

Harvesting in Forest Areas Diverted for Non-Forestry Purposes: Felling of trees on forest land required by the other departments such as Irrigation, PWD, etc., will only be undertaken after the proposals for the use of forest land for non-forest purposes are finally approved by the Government of India under the provisions of the Forest Conservation Act 1980. The Deputy Conservator of Forests, after preparation and sanction of estimate by competent authority, may permit felling of trees on forestland diverted for the non-forestry purposes as approved under the provisions of the Forest Conservation Act 1980. The material obtained from such harvesting will be brought to the depots and will be disposed off as regular coupe material.

Harvesting of Dead, Damaged, Fallen and Uprooted Trees in a Storm: Removal of dead fallen firewood and trees uprooted by wind or storm from all parts of the forests, except the coupes due for working, will be done in the following manner. Every year in the month of October each beat guard will report the availability of dead fallen firewood and trees uprooted by wind or storm to the concerned Range office. The Range Forest Officer will estimate availability for such material in each compartment and ACF concerned will verify the same and mark accordingly. At least two dead and fallen trees are required for retention from wildlife conservation. Wood removal will be carried out from the compartment after approval of the Deputy Conservator of Forests. The details of material obtained from each compartment and revenue realised from it will be entered in the respective Compartment History Form. Harvesting of dead and fallen firewood is governed by the Nistar rights and privileges as admitted in the Nistar-Patrakor directed by the government from time to time.

No irregular harvesting for the purpose of undertaking plantations/ afforestation works under schemes outside the scope of this working plan will be taken up in any of the areas under the working plan.

12.9 MAINTENANCE OF FOREST LAND RECORDS:

Maintenance of the Land Records and Forest Maps: The forestland records and the forest maps will be brought up to date, and maintained as such. A certificate to this effect will be recorded and updated annually in the Form No 1- Register during the month of June.

Forest Notification: Unclassified Forests and Non-Forest areas transferred for the compensatory afforestation shall be immediately proposed for notification as the Reserved Forests and the reservation process shall be initiated with the section 4 notification under the provisions of Indian Forest Act 1927.

Reconciliation of the Revenue Records: The revenue records will be reconciled on the basis of the Forest Notifications. The Collector and the Deputy Conservator of Forests will jointly ensure that the Revenue Records are brought up to date according to the Forest Notifications. Since the Divisional Commissioner issues the Forest Notifications, there is no apparent need to issue separate orders for the mutation entries. The Revenue Department will provide a certified copy of the Records of Rights to the Gondia Division to mark completion of the process.

Permanent Nursery and Central Depot:

The central nurseries will be used for producing Bamboo rhizomes and Teak stumps; and non-Teak seedlings in poly-pots or root-trainers as required for the plantations. A proper Nursery Registers should be maintained in all nurseries where entries regarding all infrastructure and machines & tools, stock, fertilizers, insecticide etc. should be made with their quantity, the date of procurement and amount.

A separate seed register should be maintained, mentioning the species of seed, quantity, source, date of procurement, percentage of germination and finally name of the site where the seedlings of these seed are planted. If a seed needs treatment then the period of treatment should be mentioned.

The central depots will be used for sale of timber, fire wood and Bamboo by public auctions. All prescribed registers and documents shall be maintained and the ACFs and D.C.F will do the physical verifications as per the guidelines and standing orders. These areas will be strictly protected from fire and theft.

12.10 POTENTIAL ECO-TOURISM SITES IN GONDIA FOREST DIVISION:

Gondia forest division has its varied flora and fauna ranging from the grasslands, the wetland to the thick forests and has quite few ecotourism sites of potential. They are not properly developed and require immediate attention.

The division has identified the potential eco-tourism sites and the list is reproduced below. Not much has been developed in these sites. Some of the sites are actually not in the forest area but are included as they can form a circuit that would be linked with the ecotourism sites for better packages whenever these sites are developed with proper management plan.

The social aspect of forests in the context of ecotourism is very important as it provides the people with employment. The other important social contribution of ecotourism is the exposure to the other cultures and the chance to educate others about one's own culture. It is generally observed that small projects in JFM villages and ecotourism sites not only provides employment to the youths but also gives a boost to their self-confidence.

The eco-sites identified also have lot of spiritual significance and religious sentiments attached to them, which is provided already under para no. 8.6 in part –I under table no. 8.2.

It shall be the duty of the DCF to harness the spiritual and cultural sentiments of the people to woo them back to the traditional conservation values that every Indian is proud of.

As these sites are yet to be developed, there is plenty of scope to develop in a manner that is both eco-friendly and beneficial to the communities. The principles of Eco-tourism stated above should be the guide for all such developments.

- Biodiversity garden, Medicinal Plants gardens, Nakshatra van etc
- Nature interpretation centers,
- Adventure Sports,
- Tent camping,
- Nature Trail,
- Observation towers,
- Camping,
- Homestay development,
- Boating,
- Observation tower,
- Bird watching,
- Protection hut.

Apart from keeping in mind the principles of eco-tourism, the Division should take all care that the following area adhered to:

1. While developing above eco-tourism sites, it should be verified that the proposed activities must not attract nor violate provisions under Forest Conservation Act 1980.
2. The Deputy Conservator of Forests shall prepare a Eco-tourism Development Plan for the division incorporating the above sites and any other potential sites.
3. Local people especially the JFM Committees and EDCs wherever are in existence should be fully involved right from the planning stage.
4. Adequate training and capacity-building of the staff and locals should form part of the development plan.
5. The specialty and uniqueness of each site should be properly documented and should be brought up in attractive brochures keeping in mind the information that tourists would require and the Dos and Don'ts for such tourists.
6. Any local traditional product, crafts, food items/local cuisine, cultural display etc should be encouraged as part of the eco-tourism package
7. The development of the ecotourism sites should go hand in hand with the conservation of the biodiversity, the nurture of environment and the appreciation of nature by the tourists.

While designing the plan the interests of the forests and wildlife should be of prime importance. The different actors/stakeholders like the community, visitors, businesses, NGOs should no doubt be taken into consideration. A common phenomenon is that ecotourism can generate both symbiosis and conflict between the actors. The potential for ecotourism to result in symbiosis between conservation (e.g., natural areas) and development (e.g., businesses) has been widely touted, but the potential for conflict should not be ignored.

CHAPTER 13

SURVEY AND DEMARCATION

13.1: BOUNDARY DEMARCATION

Demarcation Priorities: In order to keep the integrity of forests areas intact, strict vigilance over the forest boundary and periodic verification of the demarcation on the ground for the entire forest area has been prescribed. However, in view of the position of demarcation and boundary pillars on the ground, priority areas for the demarcation work have been identified. For the purpose of boundary demarcation, the following areas have been identified in the order of priority;

- Notified Reserved Forests.
- Notified Protected Forests.
- Outer boundary of compartment in which erstwhile forest villages are located.
- All unclassified forests with the Division.
- Zudpi Jungle transferred to the Division.
- Disforested areas against various projects.
- Forest areas where exact boundaries are not shown on the forest maps.

13.1.1: Special Objective of Management:

1. To collect all relevant Notifications, Maps and other records
2. To identify and carry out the survey and demarcation work of all un- demarcated forest lands
3. To maintain boundaries of forestlands in the Division by permanent pillar marks, to act as psychological barriers.
4. To ensure effective protection of the forest resources against adverse influences.

13.1.2: Approach to the Forest Demarcation: Well-defined Forest boundary is a prerequisite for effective forest protection and its sustainable management. However, in case of most of the protected forests, the land is neither properly surveyed nor demarcated on the ground. In case of demarcated protected forests, the forest boundary marks are either missing or in a very poor state. Forest areas vulnerable to boundary obliteration, need to be identified for survey and demarcation so that forest encroachment on the forest fringes could be detected

promptly. Presence of boundary marks also serves as psychological barrier against the forest encroachment. Artificial boundaries adjoining non-forest land are proposed to receive the highest priority to ensure protection of these areas.

The procedure for Demarcation of un-demarcated Forest Lands should have the following steps:

1. All the notifications should be collected
2. All the relevant maps (Topo-sheets of RF, Bandobast Maps, Consolidation maps and resurvey maps for PF, Un-classed Forests and Zudpi jungle) to be collected. Demarcation should be carried out with the help of the map, which was the basis for the notifications under Indian Forest Act.
3. In case of Protected Forests and recently declared RF, ground Survey to be carried out with the help of TILR.
4. Appropriate pillars to be fixed immediately after the survey.
5. Boundary lines between forest and non-forest land to be taken on priority.
6. Proper records of boundary demarcation to be maintained in the boundary register, both at Range as well as the Division level.
7. Reconciliation of Forest and Revenue records should be done every year.

The forest maps, by using GIS software, have been developed and the total length of external boundaries is being calculated, by digitising external boundaries in Geo-media software.

13.1.3: Demarcation of Zudpi Jungle: The Zudpi Jungle areas were taken over by the Division, without due verification of records and demarcation on the site. Most of these areas were not demarcated before taking over. Hence, examination of records, collection of relevant authentic maps and demarcation of the area is essential for the entire Zudpi Jungle. Majority of these areas have been proposed for notification under section 4 of IFA, 1927. This process shall be completed expeditiously and enquiry will have to be conducted in a time bound manner.

13.1.4: Fixing Boundary of the erstwhile Forest Villages: There were six forest villages, which were located within the Reserve Forest compartments. They have been formed into the revenue villages in the year 1977 by disforesting the requisite area of the reserved forest of the respective compartments. The boundaries between the forest land and the village within these compartments however are not clear on the ground. Therefore, it is necessary that outer

boundary of village is surveyed and new pillars are to be erected and accordingly maps may be generated.

13.1.5: Boundary Demarcation and 1/5th Boundary Demarcation Scheme: It is prescribed that the boundary of all the lands, Reserved Forest, Protected Forest, Un-classed Forest, Zudpi Jungle and non-forest land, in possession of the Gondia Division, should be properly surveyed and demarcated on top priority and should be completed within 5 years period. These boundaries then should be annually maintained under the 1/5th Boundary Demarcation Scheme. **Appendix No. XIV** shows the 1/5th. Boundary demarcation and verification scheme of already demarcated forest lands.

1. **Demarcation of the External Forest Boundaries:** The length of the external boundary of the Reserved Forests is 1121.00 km, of which about 144.00 km, is formed by permanent natural features. Whereas, the boundary line of Protected Forests is 705.00 km, out of this 105.00 km. formed by permanent natural features and 600.00 km. is the artificial boundary. Large portion of this artificial boundary along the PF is not demarcated and it is under progress by fixing new RCC pillars. The survey works are carried out with the help of TILR. In May 2001 the Principal Chief Conservator of Forests approved a demarcation model, using a series of concrete pillars. This model as modified, till date, shall be followed for the external boundary.
3. Cement-concrete pillars at bends and corners of the artificial boundaries should be raised immediately after the survey. This work will require substantial fund allocation, as it will need sizeable manpower and resources.
4. **Demarcation of the Internal Forest Boundaries:** Internal boundaries between compartments or those between the Reserve Forests and the Protected Forests may be demarcated using traditional stone cairn, earthen cairn or standard wooden pillar.
5. **Routine Boundary Maintenance:** The Beat Guard after his personal inspection of the entire compartment must submit the 'Compartment Inspection Certificates' every month before disbursement of the monthly salary. The certificate must record condition of forest boundaries including pillar numbers and inter-pillar visibility conditions. Separate certificate should be submitted for each compartment. The Round Officer should submit similar certificates for his inspections.

6. The Range Forest Officer should check accuracy of the ‘Compartment Inspection Certificates’ according to the prescribed norms covering each round. He should personally check vulnerable compartments other than those covered by the Beat Guards and the Foresters.
7. **Specification of Boundary Pillars:** The prescribed design must be followed to carry out the task of fixing the boundary pillars as prescribed. According to provisions contained in the BFM Vol. III, Conservator of Forests is empowered to give sanction to the design of the pillars. However, the Principal Chief Conservator of Forests (HoFF) M.S. has approved a estimate of revised forest boundary demarcation and erection of permanent boundary marks vide circular no. 27/02/CR. 86/682, dated 27 January 2020.

Table no. 13.1: Specification of Boundary Pillars

Sr. No.	Description	Class-I Boundary mark	Class-II Boundary mark
1	Flag stone (to be casted at the time of casting of pillar)	0.23mx0.23mx0.23m	0.23mx0.23mx0.23m
2	Foundation size below GL	0.90mx0.90mx0.30m	0.60mx0.60mx0.30m
3	Base size	0.90mx0.90m	0.60mx0.60m
4	Height above GL	1.00m	0.75 m
5	Top size/dimension	0.60mx0.60m	0.45mx0.45m
6	Weight	1687kg	674kg
	Construction cost as per 2018-19 S.S.R. Rs. (Note: The estimated cost may vary as per site conditioned & it is exclusive of taxes)		

8. **Specification of a Boundary Cairn:** Artificial boundaries should be marked with a series of boundary Cairns. A Cairn should be made of loose stones upon excavated foundation to a depth of 30 (thirty) centimetres and shaped like a truncated cone. A cairn will be 1.20 m high, and have 1.20 m top diameter and 1.70 m base diameter, as described in the Central Province and Berar Forest Manual. A slab stone (0.20 x

0.20 x 0.90 meter) or a timber stake projecting 1/2 (half) meter in the centre will be fixed firmly on the top of the cairn, and marked with cairn serial number. Each boundary marks (cairns) must be visible from its neighbouring ones on both sides. Distance between two consecutive boundary marks should not exceed 250 meters. The cairn stone or post should be colour washed with white colour for the open forests and red for the closed forests. Such Cairns can be made of earthen mass, where stone boulders are not available.

9. Recording Locations and updating the length of the Boundary Pillars or Cairns:

The location of the boundary pillars and Cairns along with their numbers should be shown on the maps. The numbers shown on the topo-sheets will be maintained. The length of the boundary pillars also should be updates.

10. **Clearance for the Boundary Line:** Boundary line should be cleared and only matured trees should not be felled for the boundary line, but shrubby undergrowth should be cleared. Norm for the external boundary line is 12 meters. The internal compartment boundary lines should be 3 meter wide.
11. **Compartment Plates:** Metal plates on the boundary trees at a height of 2.5 to 3.0 meters will be fixed on the corners and roughly at half-kilometre interval on the side away from the compartment. The colour of the plate and lettering should agree with the state-level general guidelines. Till such guidelines are available, red letters on white plates will be used. Size of the plate and letters should not be less than 15 cm and 10 cm, respectively. Strokes should be at least 2 cm wide.
12. **Colour Wash on the Boundary Marks:** The Beat Guard will be responsible for annual freshening of the pillar numbers, the compartment plates and the colour-wash of the boundary pillars carried out in September-October.

13.2: DEMARCATION, PREPARATION OF TREATMENT MAP AND MARKING OF COUPES:

Demarcation of Coupes:

1. The annual coupes to be worked as per the prescriptions of the plan, will be demarcated one year in advance, and each coupe, if so required, is proposed to be subdivided into four sections for effective management and control. The Range Forest Officer will thoroughly inspect the coupe after demarcation and issue 'Coupe Demarcation Certificate' in the

prescribed format, given in the following paragraph, which is to be verified by the concerned Assistant Conservator of Forests.

2. Format for the Coupe Demarcation Certificate is prescribed, as follows, in Form No. 13.1

Form No. 13.1

“I ----- R.F.O. -----
 ---hereby certify that I have personally inspected the demarcation of the coupe No. -----
 ----- in the Compartment No. ----- of F.S. -----
 of W.C. -----on dated-----/-----/----- and found
 that the coupe has been demarcated as prescribed in the working plan. The area of the
 coupe is ----- hectares.

Name, Signature

Date:

and Official Seal of the RFO.

3. Annual coupes have been prescribed to be demarcated by cutting and clearing bushy undergrowth on 3 (three) metre wide line and by erecting pillars or posts up to 2 meter height in middle of the cut line at suitable intervals, so as one pillar shall be visible from the other one, except where the coupe boundary runs along streams, fire line or road. The pillars shall bear the coupe number, name of the felling series and the working circle on the side away from the coupe.
4. Selected trees, above 45 cm gbh, at suitable intervals standing on the periphery of the coupe will be given two coal tar bands and a geru band in between after scrapping the loose dead bark. The lower coal tar band will be at B.H. and the other coal tar band will be 15 cm above it. Just below the lower coal tar band Tree serial number in Arabic will be given on the side away from the area of the coupe. The bands and serial numbers of such trees will be maintained in the marking register in, the following, **Form No. 13.2**.

Form No 13.2

List of trees on the coupe boundary

Sr. No.	Name of species	GBH (OB)	Remarks

5. No tree, bearing the coupe demarcation bands, is proposed to be marked for felling.

6. **Demarcation of Sections:** For effective monitoring and control of the harvesting operations, each coupe marked for felling in SCI and Improvement Working Circles will normally be divided into four approximately equal sections. Sections will be demarcated by 1.5 m. wide cut lines by clearing brushwood, unless the section line runs along a permanent feature.
7. Trees above 45 cm girth, selected at suitable intervals on the inner edge of the 1.5 m wide cleared section line will be given two coal tar bands 15 cm apart, the lower coal tar band being at breast height. Just below the lower coal tar band section number will be given on the side away from the area they would denote.
8. **Demarcation of Protection Areas:** Selected trees, on the periphery of the Protection areas will be given two geru bands 15 cm apart, lower band being at B.H. In addition, a cross in geru colour between the bands will also be given on the side away from the protection areas. All those trees will be serially numbered. The serial number will be given on the side away from the protection area just below the lower geru band, on the side bearing the cross. All the protection areas will be numbered in Roman numerals and the trees standing on the periphery of each protection area will be numbered in Arabic, adopting separate series for each area, so that the trees on periphery of Protection Area No.I will bear the Sr. no. I/1, I/2, I/3, etc. and the similar trees on the periphery of Protection Area No. II will bear the Sr. no. II/1, II/2, II/3, etc. The protection area will also include sample plot and presentation plot, shown in Red. These are to be excluded from the marking.
9. **Demarcation of other Areas given in the Treatment Map:** The other categories of areas shown in the treatment map will be marked by giving one geru band at B.H and one coal tar band 5 cm above it.

Treatment Map:

1. Immediately, after completion of demarcation of the coupe, RFO will prepare the Treatment map of the coupe by clearly showing the various Treatment-type areas by laying a base line and 100m X 100m grid on the ground as well as on the map. The concerned ACF will verify the treatment map and make corrections, if necessary, before submission to the DCF for approval.

The treatment map will bear the date of preparation by the Range Forest Officer and the date of verification by the Assistant Conservator of Forests and their official seals and signature with name.

2. Preparation of treatment map will preferably be done one year in advance of the coupe working. Timely preparation would facilitate necessary checking and corrections, if any in time.
3. Immediately after seeking approval of the treatment map, site-specific Work Plan for the entire coupe shall be prepared by the RFO, verified by the ACF concerned and approved by the DCF.

13.3 PLANTATION MODELS

The Principal Chief Conservator of Forests (Head of Forest Force), Maharashtra State, issued a letter No. Desk-1/Rohoyo/F.N. 10/17-18/400, dated 31 May 2017 regarding the evaluation report on plantation activities. The report highlighted several shortcomings:

- Plantation records were not updated.
- Plantation work did not match the estimated budget.
- Delayed soil filling.
- No mandatory inspection of plantations at senior levels.
- Gaps in plantation protection.
- Lack of proper documentation for plantation activities.
- As a result, the intended objectives of the plantation work were not being achieved.

To address these issues and make policy and related decisions, a committee was constituted under the chairmanship of the Principal Chief Conservator of Forests (Production & Management), Maharashtra State, Nagpur.

The committee took the members' opinions, deliberated, and prepared a report for the Principal Chief Conservator of Forests (Head of Forest Force), Maharashtra State, Nagpur. The report was submitted to the Principal Chief Conservator of Forest (Head of Forest Force).

The Principal Chief Conservator of Forests (Head of Forest Force), Maharashtra State, Nagpur, approved the plantation models and issued detailed instructions via letter No. Desk-1/Rohoyo/F.N.10/2282/17-18, dated 07/03/2018.

Improved Plantation Model

A. Mahatma Gandhi National Rural Employment Guarantee Scheme (Improved Plantation Models)

Under forestation, 9 plantation models and auxiliary models 7 & 8 are approved, totaling 90 models. Among these, models 3 to 5 involve activities like pit digging, gridding, fencing for plant protection, issuing cement pillars, enclosing plantation areas, providing treatment to seedlings, preparing inspection paths, and harvesting plantation produce. These improved plantation models (3 to 5 and 9-A to 8-A) are approved (Annexure - 9).

B. Models for plantation on trenches

Three new plantation models have been approved by considering the local conditions. The models include:

1. 367 contour trenches with 734 saplings
2. 1200 continuous contour trenches with 600 saplings
3. 400 contour trenches with 800 saplings and 400 Continuous contour trenches with 800 saplings total 1600 saplings (Annexure - 2).

C. Irrigated plantation models with fencing

In drought-prone areas with livestock grazing, three types of plantation models involving wire fencing and irrigation have been approved for successful plantation:

1. 625 saplings/Ha with pit size 0.45*0.45*0.45
2. 1111saplings/ha with pit size 0.45*0.45*0.45
3. 3. 367 contour trenches with 734 saplings (Annexure - 3).

CHAPTER 14

UNCLASSIFIED FOREST OF GONDIA FOREST DIVISION

14.1 Unclassified forest of Gondia forest Division are presently or previously had been Government forest land which are shown in Forest records as part of the working plan. In the previous working Plan these forest areas were put under different working circle including Selection cum Improvement working circle and prescriptions were given for them to be treated in accordance with the working circle they are allotted to. Prior to Enactment of M.P Abolition of Proprietary Rights act of 1950 these land were under the control of private proprietors. Since 1951 these forests were taken control over by Revenue department and between 1951 to 1954 most of these forest areas were handed over to Forest department. Sincere efforts for Management of these forests were made around 1960 when Gondia forest Division was carved out of Bhandara Forest Division. A working scheme for such Government forest land was prepared by ACF Working plan Bhandara Shri. J.H.Benakatti for the period 1961-62 to 1971-72 to incorporate such Government forest under regular Silviculture management. The working circles under this scheme comprised of SCI, Coppice with Reserves working circle, IWC, Pasture working circle, Miscellaneous working circle and Bamboo (overlapping) working circle. Management maps were also prepared for these Forests on a scale of 4 inch is to mile. In fact this working scheme could not be approved by the Government at that time but very lately these unclassified forest areas were incorporated in the previous few working plans under regular management but in practice it could not, for some exceptions, be implemented.

14.2 The area comprises of areas categorized as Unclassified forest in the previous working plan for Gondia Forest Division written by Shri. T.K. Choubey. The area comprises of patches of miscellaneous forests to degraded forest areas interspersed with agricultural lands (Class I and II Lands). A large part of these forests has been given back to Revenue department and distributed to people for agriculture or given to other Government agencies for various purposes. A very small part of this working circle comprises of areas received by forest department as Compensatory Afforestation land under the provisions of FCA 1980. The total area kept under this Working circle is around 7240 hectares. These forest lands are distributed in 51 villages.

14.3 During the presentation of DWPR for Gondia Division on 10 July 2024 SCC recommended to reverify the areas under Un-class Forests and accordingly the areas under unclassified forests were reverified. During the Standing Consultative committee meeting a decision was taken to continue the working plan of Gondia Forest Division for next 10 years as the plan was written for 20 years with a felling cycle of 20 years in different working circles. During the Standing Consultative committee meeting some objections were pointed out regarding unclassified forests. It was stated in the meeting that unclassified forest area needs to be examined and reclassified if necessary. Hence, in accordance with the direction of the Standing Consultative committee the area of the unclassified forest was re-verified and was found that there is a profound mismatch between the areas as stated in the working plan and the area shown in the available land records with revenue department. A total of 7240.58 hectares area is shown to be present in the Division under different working circles spread out in 51 villages. A Area of un-class forest in one Village named Lohara was added in the year 2015; as the area in this village was received from Revenue Department so it is clear and the whole area is in possession of forest department. For remaining 50 villages area needs to be reconciled with revenue records. At present there are no old records of unclassified forest in these 50 villages to be found in Gondia forest Division and hence old records of Bhandara division were inspected as Gondia Forest Division was carved out of Bhandara Forest Division during 1960s.

14.4 Two important records related to un-class forest could be found in Bhandara Division:-

14.4.1 A Forest register for Sakoli range containing details of survey numbers belonging to Dochand forest class as named (which are unclassified Government forests land in possession with forest department) pertaining to only 4 villages.

14.4.2 A Working scheme for unclassified forest named as "Working scheme for Do-Chand forest of Bhandara and Gondia Divisions for the period {1961-62 to 1971-72) by the then A.C.F D.H.Benakatti, working plan officer, Bhandara which contains allotment of compartment to different working circles.

14.5 The above mentioned Forest Register containing survey details carries information of only 4 villages and the information about remaining 46 villages is not available. The details of the unclassified forest area in these 4 villages has been reconciled with revenue records such as 7/12 and it is found that out of around 934.85 hectares area shown in

the register only 721.4 hectare area is in possession of forest department and rest has been either allotted to people or other agencies by the Government through revenue department prior to enactment of Forest Conservation Act 1980 or is presently under encroachment. The details of the unclassified forest area in 4 villages as mentioned in the Forest Register are shown in Table No. 14.1 below:-

Table No. 14.1

Sr. No.	Village	Area as given in above mentioned Forest Register		
		Forest land as per 7/12 (ha.)	Forest land allotted to people before 1980 (ha.)	Total (ha.)
1	2	3	4	5
1	Baki	59.811	13.990	73.800
2	Mendaki	97.960	72.760	170.720
3	Chikhali	46.810	52.690	99.500
4	Saigoan	516.830	74.000	590.830
	Total	721.411	213.440	934.850

14.6 It is imperative to mention that management maps were prepared for these forests in which compartments were laid for the management of forest area under this working scheme. But at present these maps are missing so area reconciliation only with the help of compartment number is not feasible unless we get survey or gut numbers corresponding to these compartments.

14.7 Standing consultative meeting for discussion of issues related to un-class forests of Gondia Forest Division was held on 5/02/2024 and suggestions are incorporated in the working plan.

14.8 Suggestions of the SCC:

14.8.1 To reconcile forest areas as shown in the working plan with Revenue records.

14.8.2 To prepare a map of the same and show it on the village map on a suitable scale.

14.8.3 To demarcate these forest areas on ground by Land Records Department followed by erection of Boundary pillars.

14.9 A general observation is that a very crude way of establishing boundary pillars is being done in the field with hardly any regards to precision. Some survey pillars are situated as far as 20 metres from their actual positions. Even settlement maps have not been taken into

account for establishing the boundary pillars at many places. It is utmost necessary that firstly those pillars should be erected which are at the corners of the Survey/Gut numbers and then only other forest pillars should be erected.

14.10 Documents necessary to start demarcation and procedure for starting demarcation of forest Boundaries:-

14.10.1 Collection and updating of documents : All records such as Notifications, Village maps (Old Settlement Maps}, Survey book having details of boundaries of survey numbers, 7 /12 extracts shall be obtained from the Superintendent Land Records at taluka offices and compare them with these records of the forest department. The discrepancies, if found shall be rectified and updated on the Form No.1.

14.10.2 Demarcation of corners of the survey numbers/ Gut number in the field jointly with the help of Land records department.

Note: Since establishment of survey pillars is not at all the mandate of forest department as forest department is not legally competent to do the same. Establishing Survey boundary pillars without taking into account land records department can always be challenged. But the field reality is different and it has been observed that despite several correspondences to Land records department the demarcation of forest land are not taken on priority basis and hence these lands cannot be left un-demarcated so forest department should erect only temporary boundary pillars at the corners of these survey/ Gut numbers. Only after their locations are verified by the Land records department, further process of permanent pillar erection should be taken.

14.10.3 The demarcation of the areas may be done with the help of CORS (Continuously Operating Reference Stations) which is the most recent and advanced process of surveying. The CORS would definitely need a permanent start point (reference point) and the survey book/Tippan which mentions the exact distance between pillars of survey numbers.

14.10.4 It is preferable that demarcation and boundary pillar erection should be done simultaneously but if due to some reasons it is not possible then it is may be better to do demarcation earlier and establish boundary pillars later. After demarcating the points of survey numbers as per available on old settlement maps co-ordinates of these points must be noted and recorded on with numbers written on the maps against coordinates for that

pillar. A wooden peg should be inserted in the ground to be covered by temporary stone cairns should be put on the point where the demarcation has been made.

CHAPTER 15

SCIENCE AND RESEARCH

15.1: PRESERVATION PLOTS:

The following are the experts from the paper 'An account of Preservation Plots in Central India' by BN Gupta and NG Totey, Indian Forester, 1994 relevant for the subject in discussion.

15.1.1: Introduction

Preservation plots, the miniature nature reserves, are demarcated forest areas set aside for the preservation of the forest in perpetuity permitting only such human interference as is necessary for their protection and maintenance. Following the recommendations of the IIIrd All India Silvicultural Conference (Anon, 1929), preservation plots in the representative areas of Chief Forest types were marked. By 1939, about 112 preservation plots were established throughout the country, when concept of preservation of both climatic and seral types was generated (Anon., 1939). In 1961, during the Xth All India Silvicultural Conference emphasis was laid on preservation of fine specimens of forests i.e. groups of out-standing trees, rare types of forests of botanical curiosity and patches of relict vegetation, specimens of managed forests (stable sub-climax stages) and climax forests.

15.1.2: Preservation Plots in Maharashtra

Preservation plots in Maharashtra have been established as early as 1955 and as of 1993, there are 23 preservation plots in Maharashtra covering an area of 517.32 ha. Out of these, 48-50% plots fall in dry deciduous forests, 30% in moist deciduous forests and about 20-22% in subtropical hill forests. There are 36 forest types as per Champion and Seth (1968) in Maharashtra spread over 44044 Km² (Anon. 1991) but preservation plots have been identified only in 5-8 types like 3B/C1, 3B/C2, 5A/C1, 5A/C3, 8A/C2 etc. The remaining forest types though important from the point of view of biodiversity are not covered.

In Gondia Forest Division no such Preservation Plot was established.

15.1.3: Recommendation for the Gondia Division:

The following are the forest types found in Gondia District.

Table No.15.1: Forest Types of Gondia Forest Division

Type	Notation	Type description
Sub-group I. Climax types	5 A 5A/C1b 5A/C3	Southern Tropical Dry Deciduous Forests. Dry teak bearing forests. 5A/C3 Southern dry mixed deciduous forests
II. Degradation stages	5/D S1	Dry deciduous scrub.

While as per the above research document ‘An account of Preservation Plots in Central India’ by BN Gupta and NG Totey, Indian Forester, 1994, the Preservation Plots are found to have been established in the Sub-group 5-A Southern Tropical Dry Deciduous Forests, there is a need to have such plots also in the rest of the Forest types found in Gondia Division namely, 5/D S1-Dry deciduous scrub. The work for the identification, plot size, demarcation and data collection should be done with the help and collaboration with the Silviculturist, Pune and his subordinate office at Nagpur.

- 1) The DCF Gondia should survey the area of the Division and identify the area under the above forest types namely, 5/D S1-Dry deciduous scrub.
- 2) In India it is recorded that the size of the Preservation plot varies from 0.1 ha to 4000 ha. The DCF shall lay plots of the size of not less than 4.0 ha and to a maximum of 20 ha. for each of the forest types mentioned above.
- 3) The plot should be well-demarcated on the ground, geo-referenced and plotted on a GIS-based map. The trees on the border should be demarcated with such demarcation as were marked in the other Preservation Plots in the country/state.
- 4) These plots shall be spared from all human interference including harvesting operations, if prescribed in the Plan. Activities shall be limited to those that would ensure protection and maintenance.
- 5) A total enumeration of the plot shall be taken up taking into account all the tree species of the forests (Species, Age-class distribution, height, etc)
- 6) The forest shall also be described in a proper manner as to its species composition, forest storey's, condition of the crop, health and vitality, presence of pests etc.
- 7) The shrubs and herbs present in the Plot should be well-documented. This shall include the lower life-forms.

- 8) The fauna available in the area should also be surveyed and documented.
- 9) The recordings for the Preservation Plots should be maintained properly for future reference.

During the process of writing of this Plan the following papers, articles, reports and documents were referred and used for the writing of the Plan.

Table No.15.2: List of papers, articles, reports and documents

Sr. No.	Department	Subject
1	FSI (Forest Survey of India)	
	i) ISFR 2015	1) The condition of the forests & forest cover over the last decade during the implementation of the plan based on the FSI satellite data.
	ii) ISFR 2017	
	iii) ISFR 2019	
	iv) ISFR 2021	
	v) ISFR 2023	2) The Plantation Tree outside forest for the State of Maharashtra (SFR 2017)
	Carbon Statistics of India	Carbon & Forest Eco-system Methodology for the assessment of Forest Carbon, accounting of Forest Carbon Stock.
2	Ground water survey & Development Agency (GSDA)	1) Assessment of Dynamic Ground Water Resources of the Maharashtra & Aquifer Parameters. 2) Taluka wise Ground Water Resources in Gondia District.
3	Control Ground Water Board (CGWB)	Water level data with the long-term trend (2001 to 2010) Ground Water Recharge, Ground Water Development.
4	Preliminary survey of Reptile Fauna of Vidhabha Region, Maharashtra, (Central India) Presented By: Parag Dandge & Ashish Tiple. The 8 th Indian Symposium of Odonatology & Biodiversity 2014 Nagpur.	List of Reptiles found in Gondia Forest Division.

5	www.iucnredlist.org	IUCN Status of animals.
6	Social Forestry Gondia	Information regarding Tree Cover outside forest area.
7	National Bureau of Soil Survey & Land use Planning (NBLSS)	1) Soil erosion classes & their areal extent & expected Soil Loss. (Soil Resources Atlas Gondia District.) 2) Slope, Soil erosion, soil texture maps.
8	C.J. Patel College of Science, Tiroda	Diversity of Wild Macro fungi in forests of Gondia District. (List of Algae and Fungi.)
9	Geological Survey of India (GSI)	Rock Formation in Gondia District.
10	DFO, Silvicultural Scientist, Nagpur	Information regarding preservation plot in Gondia Division.
11	Maharashtra Remote Sensing Application Centre (MRSAC)	Village Boundary & Survey No. Data of Gondia District.
12	An Account of Preservation plots in Central India by B.N. Gupta&N.G. Totey, Tropical Forest Research Institute, Jabalpur.	Information on the Preservation plots in Maharashtra

15.2: RESEARCH GAPS:

Because of the lack of any research works/paper related to the Division and the Vidarbha region, the many chapters that involve specific information on the Forest Division of Gondia could not be written with accurate data. The research gap is in almost every aspect of the Working Plan as our writing of the Plans in early years has not looked into the new aspects that the need of our present times requires, like Biodiversity and all its components, Climate change and Carbon sequestration, NTFP research, ITK, Trees outside forests, Social and cultural aspects of forests, Ecosystem Services etc. However, areas in which the research gap is felt most area:

Biodiversity: Apart from a few mammals, trees and a few major herbs and shrubs, the Department does not have record of the whole gamut of biodiversity of the Divisions. It is

clear that a Biodiversity Assessment study is very much required for the documentation of the richness of our forests.

Carbon sequestration: Carbon sequestration is an important aspect of the contribution of forests towards Climate Change. However, since we do not have base data, it would be difficult to monitor the increase/decrease in sequestration levels. Also, the methodology for the assessment of the different pools of Carbon should be very clear to the SOFR units so that information will be more accurate. The research that will be required for the Tier-III level measurements of the key C-stock components over time.

NTFP Research: NTFP is integral to the health and productivity of the forests. Though we have data on the major NTFP tree species and few prominent medicinal plants, it is known that the people around forests use many more variety of species than we ever know. The list is appended at Introduction part of the Plan and the number of species used is far more than earlier known. There is a need for research to be done for the documentation of all the species that are being used by the people and also to devise the best methods for the harvest of the species through experimentation.

CHAPTER 16

SUMMARY OF PRESCRIPTION

16.1: INTRODUCTION:

Gondia Forest Division is situated between 20° 17' to 21°21' North latitude and between 77° 30' to 79° 15' East longitude. The boundary of the Gondia Division is coterminous with the boundary of the Gondia district. The forest areas of Gondia Division occur in compact blocks and some scattered patches. The forest type belongs to the Sub group Southern Tropical Dry Deciduous Forest. The boundaries of the tract dealt with are as shown below.

Table no. 16.1: The boundaries of the tract dealt

S.N.	Direction	Name of Forest Division/ District
1	North	Balaghat district of MP State
2	North & North-East	Chattisgarh State.
3	East	Rajnandgaon district of Chattisgarh
4	South	Wadsa & Bramhapuri Division.
5	West	Bhandara Division.

Forests of Gondia division are under scientific management since 1893 when the first working plan of Range wise plan was implemented. This Plan replaces the working plan written by Shree. T.K. Choubey.

For Administrative convenience the Ranges, Rounds and Beats were reorganized in year 2006 and the entire division has been divided into 12 Ranges, 62 Rounds and 294 Beats.

16.2: Distribution of the forest area for proposed working plan:

Abstract of Gondia Forest Division								
S. N	Name of Range	(RF, NRF, PF, Gose PF, Zudpi Jungle & Unclassed Forest)					Private land taken Over as a Compensatory land under F.C.A. 1980 Area in ha.	Total Area in ha.
		RF	PF	Grand Total (RF+PF) 3+4	Zudpi Jungle	Unclassed Forest Area in ha.		
		Area in ha.	Area in ha.	Area in ha.	Area in ha.			
1	2	3	4	5	6	7	8	9
1	Tiroda	2363.570	3345.387	97.000	2147.500	0.000	0.000	7953.457
2	Gondia	1267.571	4175.156	803.100	3338.920	130.500	0.000	9715.287

3	Goregaon	1547.033	6705.087	297.500	1584.560	2315.499	2.610	12856.289
4	Amgaon	579.100	2718.594	320.000	2520.860	127.592	0.000	6266.146
5	Salekasa	4206.770	5360.421	71.000	4691.250	1069.603	8.140	15407.184
6	North Deori	5322.900	8040.656	408.360	6.060	1011.047	4.980	14794.003
7	South Deori	5085.400	6482.541	173.150	378.740	0.000	9.420	12129.251
8	Chichgarh	12412.290	10156.367	56.850	801.800	53.454	0.000	23520.761
9	Sadak Arjuni	7114.862	8460.843	304.000	1773.350	964.453	0.000	18617.508
10	Nawegaon bandh	10611.907	4569.820	282.350	1014.500	182.551	0.000	16661.128
11	Gothangao n	11118.100	3694.401	58.000	1228.740	1381.879	0.000	17481.120
12	Arjuni Morgaon	8447.650	4525.662	124.300	389.400	0.000	0.000	13487.012
	Grand Total	70477.153	68274.975	2995.610	15875.680	7240.578	25.150	168889.146

16.2: DISTRIBUTION OF AREA TO VARIOUS WORKING CIRCLES: The allocation of forest areas under various working circles of the proposed working plan is as under.

Table No.: 16.3: Area allocation to different Working Circles

Sr. No.	Name of working Circle	Area allocated(ha)
1	Selection –Cum- Improvement	62561.968
2	Improvement Working Circle	22648.129
3	Afforestation Working Circle	34078.693
4	Protection Working Circle	11318.628
5	Miscellaneous Working Circle	38281.728
6	Bamboo (Overlapping) Working Circle	33371.918
7	Wildlife (Overlapping) Working Circle	Entire Area
8	NTFP (Overlapping) Working Circle	Entire Area
9	JFM (Overlapping) Working Circle	55037.566

16.3: THE WORKING CIRCLE WISE SUMMARY OF PRESCRIPTION:

16.3.1. SELECTION-CUM-IMPROVEMENT WORKING CIRCLE:

Coupe Demarcation & Treatment Map:

1. **Demarcation and Marking:** One year in advance
2. Treatment Map to be prepared as prescribed

3. **A type:** Protection area (A1: Steep slopes, A2: 20 M wide strips along streams, A3: excessively erosion prone areas)
4. **B-type:** Under stocked and Blank areas (density <0.4)
 - a. B1-Area with rootstock and NR,
 - b. B2-Area without NR
5. **C-type:** Pole crop and plantations
6. **D-type:** Well stocked areas (density >0.4)

Marking:

1. **A type area:** No marking
2. **B type:** Dead and diseased trees, live high stumps
3. **C type:** Thinning marking
4. **D type:** Enumeration of trees in Approach girth class and above is prescribed. Trees above selection girth as per regulation of Smythies safeguarding principle. Dead & malformed trees, live high stumps are to be marked.

Silvicultural System:

1. Selection-cum-Improvement system
2. Trees above Selection Girth are prescribed for felling as per principles Of safe guarding future yield.
3. Openings created by felled trees would promote NR of light demander species
4. Hygienic operations (removal of dead, malformed, live high stumps) will improve the existing crop.

Regeneration:

1. **Natural Regeneration:** NR of seed origin of valuable species to be preferred and managed through cultural operations in D areas and B1 areas.
2. **Artificial Regeneration:** Only in B2 type area if site is suitable.
3. Strict protection from fire and grazing
4. Tending of natural regeneration of valuable species in B Type area.

SMC Works:

1. Gully plugging and other SMC works, as described in chapter of Miscellaneous Regulations shall be taken up in the A3 type area.

2. SMC works will be along with marking operation and completed before on set of monsoons.
3. SMC Working are to be based on the requirement of site.

Subsidiary Operation:

1. CBO works: Subsequent year of main felling
2. CBO works like cutting left over marked trees, removal of damaged trees, singling of multiple coppices shoots, etc
3. NR or ANR should compulsorily be carried out immediately after CBO in the same year in D- areas. This is necessary to regenerate the area felled as per Hon. SC orders
4. Cleaning operations: 6th Year

16.3.2. IMPROVEMENT WORKING CIRCLE:

Coupe Demarcation & Treatment Map:

1. Demarcation and Marking: One year in advance Treatment Map to be prepared
2. **A type:** Protection area (A1: Steep slopes, A2: 20 M wide strips alongstreams, A3: excessively erosion prone areas)

B-type: Understocked areas (density <0.4)

C-type: Congested Pole crop

D-type: Well stocked areas (density >0.4)

Marking:

1. **A type area:** No marking
2. **B type:** All dead trees, live high stumps
3. **C type:** The congested pole crop shall be marked for thinning.
4. **D type:** All fruit bearing species shall be reserved.

All dead & malformed trees retaining 2 tress per ha. and all live high stumps shall be marked for felling. Matured trees that have developed hollowness and show visual sign of decay will be marked for felling.

Silvicultural System:

1. Hygienic operation of improvement felling.

2. Adequate growing space is provided to trees of valuable species.
3. The improvement felling supplemented by tending of naturally generated crop & root stock will aid in transition of middle-aged stem to maturity.
4. The species whose population in the 'stand' dynamics is less than 1% shall be retained till they reached the rotation age.

Regeneration:

1. **Natural Regeneration:** NR of seed origin of valuable species to be preferred and managed through cultural operations.
2. **Artificial Regeneration:** Only in B type area if site is suitable.
3. Strict protection from fire and grazing
4. Tending operation for Natural regeneration in the 'D' type area & Root stock management in the 'B' type shall be taken up.

SMC Works:

SMC works, as described in the chapter of Miscellaneous Regulations are prescribed in A & B type area.

Subsidiary Operations:

1. **Cleaning operations:** 6th Year
2. Thinning is proposed to be carried out in the patches of Dense pole crop By maintaining average spacing of one third of the crop height.
3. Afforestation Working Circle:

16.3.3 AFFORESTATION WORKING CIRCLE:

Coupe Demarcation & Treatment Map:

1. Demarcation and treatment map will be prepared one year in advance.
2. Treatment map would show A,B,C, D areas
3. A type: Protection area (A1: Steep slopes, A2: 30 M wide strips on both side of streams.
4. B-type: Understocked areas (density <0.4)
5. C-type: Congested Pole crop
6. D-type: Well stocked areas (density >0.4)

Silvicultural System:

1. Only hygienic fellings prescribed (Dead, live high stumps)
2. Plantation work in B type areas.
3. Planting of Tall seedlings prescribed.
4. Not more than 50 ha. plantation per coupe.
5. JFMCs to be actively involved.

Regeneration:

1. Tending of Natural regeneration & existing root stock is prescribed to be given preference over planation.
2. Cultural operations for natural regeneration in 'D' type areas Root stock management in 'B' type areas are prescribed.

SMC Works:

1. SMC works will be done as prescribed in the relevant paras under Miscellaneous Regulation.
2. No specific quantum of such works has been prescribed.

16.3.4 PROTECTION WORKING CIRCLE:**Coupe Demarcation & Treatment Map:**

1. **Demarcation and Marking:** One year in advance
2. Treatment Map to be prepared

A type: Protection area (A1: Steep slopes, A2: 20 M wide strips along streams, A3: excessively erosion prone areas)

B-type: Unders tocked and Blank areas (density less than 0.3)

C-type: Group of naturally green poles.

D-type: Well stocked forest patches.

Treatment:

1. A type area: Harvesting of standing trees is strictly prohibited.
2. B type: No. harvesting.

All seedling & saplings of valuable species more than 1 mtr.in height will be nursed as future crop.

3. C type: Group of pole crop will be thinned by maintaining average spacing. No planting will be done.
4. D type: No harvesting of green trees & Plantation is not prescribed.

Silvicultural System:

1. Silviculture system is proposed on the pattern of watershed management.
2. Harvesting of green trees is prohibited.
3. Removal of dead trees by retaining two dead trees per ha. as snags is permitted.

Regeneration:

1. Natural Regeneration: All seedlings and saplings of valuable species more than 1 meter height will be nursed as future crop.
2. Strict protection from fire and grazing

SMC Works:

Soil & Moisture conservation works to prevent soil erosion and siltation.

16.3.5 MISCELLANEOUS WORKING CIRCLE:

Coupe Demarcation:

The coupe due for closure to grazing will be demarcated one year in advance.

Treatment:

1. Removal of invasive weeds.
2. SMC work as per site requirement.
3. In suitable blank areas, regeneration of grass through seed broadcasting, area closure through enclosures is prescribed.
4. JFMCs to be actively involved.

16.3.6 JOINT FOREST MANAGEMENT (OVERLAPPING) WORKING CIRCLE:

Prescription:

1. JFM micro plans are to be dovetailed with broad prescriptions of approved working plan.

2. Maintenance of forest boundary, removal of encroachments, control over illicit cutting, illegal grazing, fire and wildlife offences shall receive priority apart from regularly undertaken works such as SMC & Plantations.
3. Transparency in programme has to be ensured through transparent payment mechanisms.
4. Villages which have not received funds should also be accorded importance.

16.3.7 WILDLIFE (OVERLAPPING) WORKING CIRCLE:

Prescription:

1. Standing Order of PCCF (WL) to be scrupulously implemented.
2. Habitat improvement works like waterhole development, meadow development to be taken up in suitable areas.
3. Creation of database w.r.t. riparian zones, saltlicks, natural wallows, resting places etc to be created.
4. Vaccination of livestock to be monitored
5. Intelligence gathering to check wildlife trade.
6. Secret service fund to be effectively used
7. Regular Sensitization of staff
8. During marking, at least 2 dead trees per ha is to be kept as snags.
9. No fruit tree to be marked.
10. Tendu Phadis / labour camps should not be close to waterholes.
11. Compensation as per Govt. orders to be dispersed immediately and transparently.
12. Effective control on forest fires.
13. Eco-development works to be started either through EDCs or JFMCs in wildlife rich areas
14. Massive awareness creation in village communities, schools, colleges, civil society, public representatives etc.

16.3.8 Non-Timber Forest Produce (Overlapping) Working Circle:

Prescription:

1. Documentation of NTFP collection.
2. JFMCs to be actively involved in NTFP collection and processing.
3. Scientific method for Gum tapping as per rules suggested by FRI to be used.

4. Regular trainings for JFMCs to be conducted for capacity building in NTFP collection and processing.

16.3.9 Miscellaneous Regulation:

1. Boundary demarcation of all undemarcated areas (Entire Zudpi jungle area, Acquired Private Forest & Non Forest land taken over for C.A.) to be accomplished in first three years of the Plan.
2. Boundary pillar which is not easily vulnerable to damage.
3. Three years Survey and Demarcation Programme
4. Boundary demarcation is necessary due to honeycombing.
5. Updation of area registers
6. Where claims are finally rejected, removal of such encroachments.

CHAPTER 17

TREES OUTSIDE FORESTS

17.1: INTRODUCTION: This Chapter deals with the important aspect of tree presence and its contribution to the tree cover of the District and Forest Division of Gondia.

Trees outside the forest are defined by default, as all trees excluded from the definition of forest and other wooded lands. Trees outside the forest are located on "other lands" mostly on farmlands and built-up areas, both in rural and urban areas. A large number of TOF consist of planted or domesticated trees. TOF include trees in agroforestry systems, orchards and small woodlots. They may grow in meadows, pastoral areas and on farms, or along rivers, canals and roadsides, or in towns, gardens and parks. Some of the land use systems include alley cropping and shifting cultivation, permanent tree cover crops (e.g. coffee, cocoa), windbreaks, hedgerows, home gardens and fruit-tree plantations (FAO).

However no specific figure for the Gondia District is available. The tree outside forests in the state of Maharashtra has not been assessed yet as per the requirement of the Code and as carried out by the Forest Survey of India. The total geographical area of the Gondia District is 5234.00 sq. km of which 1903.81 sq.km is forest cover.

As noted in the Para 2.7 in Part I, the Social Forestry Department (SFD) of the State has the mandate for the greenary outside forest area. Since the early 1980s the SFD has carried innumerable plantation and plantation-drives across the state. It has not only conducted such plantations but has backed-up with good awareness and extension efforts which have borne fruits in many ways. The SFD has been carrying out plantations in the private areas since 1982 in the District which include block plantations, agricultural bund planting and road-side plantations which form a substantial quantity and forest cover in the areas outside forest. It is interesting to note that the Department has also carried out the assessment of the success and survival of these plantations in 2005 and the results are very encouraging.

As per assessment of year 2013 to 2022, the Social Forestry Gondia Division carried out Block Plantation for a total of 4025 beneficiaries and planted 808.72 ha. area. The total number of seedlings planted were 11.27 lakhs of which the total number of seedling surviving at the time of handing over the scheme was 7.32 Lakh. During the period the Road-side Plantation of a length planted of 989.15 km. with 10.26 Lakh planted seedling was carried out of which the total of 5.64 seedlings survived at the time of handling over the

scheme. Hence, the total No. of plants at the time of handling over the scheme is 1296250 (732325 + 564025). The assessment of the survival as on date is required to be carried out. The above information has been extracted from the booklet prepared by the Gondia Social Forestry Division where year-wise, scheme-wise and species planted are given. The same is too bulky to be appended,

The Trees Outside Forests need to be assessed by the Social Forestry Division of the District. With the present data already available with the Division, a precise number of trees and forest cover present in the areas outside forests can be arrived at. There is a need to design a model for the survey of trees outside forest at the state level so that a realistic figure of the TOF could be arrived at.

The Forest Survey of India, Ministry of Environment and Forests has come up with the field manual on assessment of trees outside forest (urban) (tof-u) which may be taken as a guide for the assessment of the TOF in the urban areas of the District.

17.2: REALISING THE DREAM OF 33% FOREST/TREE COVER

In tune with the objectives of our National Forest Policy'1988 we have to achieve a national target of bringing 33% of landmass of our country under forest and tree cover for ensuring ecological security and environmental balance. However forest cover and Tree cover in India has over the years stabilized at around 23 % of geographical area and as for Gondia we have only about 13% of the total geographical area under forest cover. The area under forest and forest land is difficult to increase, in fact, lot of diversion of forest land take place from year to year. As such there is hardly any scope to increase the recorded forest area in Gondia or in the country in general.

The only way left for the increase of forest cover and tree cover has to be through afforestation activities in non-forest areas. The areas outside forests comprises mainly of private farm forestry, canal bank areas, Road side strips, Railway line side strip, blank and degraded land, wasteland etc. Apart from increasing the tree cover, extension of forestry in non forest areas especially as agro-forestry and farm forestry has tremendous potential to increase production of timber and other wood products and reduce the pressure on natural forests. We are going to explore the following means of bringing more Trees outside Forest.

17.3: AVAILABILITY OF LAND FOR AGRO-FORESTRY:

As per the assessment of the M S Swaminathan Research Foundation, Chennai in 'Designing Rural Technology Delivery Systems for Mitigating Agricultural Distress: A study of Gondia District', the following is the land-use pattern of the District of Gondia.

The wasteland and area under Barren uncultivable wasteland which is very much needed figure for assessing the possible expansion and scope of forestry and agroforestry.

The area under current fallow and other fallows which is about 750 sq. kms is a potential area for agroforestry under its different types namely, Agrisilvicultural, Silvipastoral and Agrisylvipastoral.

The culturable wasteland and barren unculturable wastelands of about 260 sq. kms is another opportunity that is open for the creation of forest crops that would benefit the local people and ease the pressure on the forests. As envisaged by the National Forest Policy, it is important that the wastelands in any part of the country and in this District should not remain but be transformed into productive lands by way of forestry and agroforestry.

The Social Forestry Department of the State and the Department of Agriculture/Horticulture in collaboration with the Forest Department should work towards the possibility of bringing this huge area under some form of forestry and agroforestry.

17.4: ROADSIDE/ CANAL-SIDE PLANTATIONS:

This is an important component of the work of Social Forestry Department and as noted above, during the last ten years the SFD Gondia has taken up Road-side Plantation of a length planted of 989.15 km. with 10.26 Lakh planted seedling was carried out of which the total of 5.64 Lakh seedlings survived at the time of handling over the scheme.

With the adoption of the Bihar Model of Roadside Plantation, it is seen that the burden on the SFD staff in taking up such plantation has reduced and that the success of the plantations is also excellent. This rate of plantation could be increased covering more sites and taking up more such plantations in the future.

17.5: OTHER MODELS AND PLANTATIONS:

The following types of Agroforestry possibilities should also be explored as per the site conditions and the requirement of the people.

- a. Boundary/Bunds Plantation: Trees on boundary + crops
- b. Block plantation: Trees + Crops

- c. Energy plantation: Trees + crops during initial year
- d. Alley cropping: Shrubs + crops
- e. Agrihorticulture: Fruit trees + crops
- f. Agrihortisilviculture: Trees + fruit trees + crops
- g. Hortipasture: Fruit trees + pasture/animals
- h. Shelterbelts: Trees +/- crops
- i. Windbreaks: Trees +/- crops
- j. Homesteads: Multiple combination of trees, fruit trees etc.

17.6: SUGGESTIVE STEPS FOR THE INCREASE OF AREA FORESTRY/ AGROFORESTRY

- a) As per the table above, the identification of the fallow lands, culturable and unculturable wasteland Range/Taluka-wise in agricultural land which is available for taking up afforestation should be done at the district level.
The area under community land should be given priority for plantations.
- b) Drawing up appropriate time specific action plan is essential, which will require the involvement of the Social Forestry Department and the Agriculture Department along with the Forest Department
- c) Farmers must be encouraged and motivated by way providing them technical assistance and cooperation by forest department and SFD for taking up planting trees
- d) Land laws, if any, should be so modified wherever necessary so as to facilitate and motivate individuals and institutions to undertake tree-farming and grow fodder plants, grasses and legumes on their own land.
- e) High quality planting stock including clonal planting stock supported with improved silvicultural management practices can usher in a second green revolution in India this time in respect of tree crops for timber and fuel-wood / fodder production. This critical requirement of genetically improved high quality planting stock should not be neglected, which will impact productivity and quality improvements.
- f) People support in forest conservation is to be recognized by the state forest departments. Appropriate extension programmes are to be undertaken to motivate and make them conscious of the value of trees, wildlife and nature in general. This can be achieved through the involvement of educational institutions, Krishi Vigyan Kendras, mass media, audio-visual aids and the extension machinery, Trainers Training Centres

to learn agri-silvicultural and silvicultural techniques to ensure optimum use of their land and water resources.

- g) The wood-based industries have important role to play in development of agroforestry. They should consider making appropriate arrangements with farmers and play a facilitative role in arranging quality planting material and enter into buy back arrangements.
- h) Preferred Tree and bamboo species under agro forestry by farmers and not naturally available in neighbouring forests may be exempted from the transit permit and felling regulations.
- i) The possibility of a Public-Private Partnership in regenerating the culturable wasteland and barren unculturable wastelands of about 260 sq. kms. should be explored. This can also be explored for raising the improved planting material for supply to the farmers.

CHAPTER 18

CONTROL AND RECORDS

18.1 CONTROL AND RECORDS:

The following records should be maintained in the Gondia Forest Division Office:

- i. Control Forms.
- ii. Compartment History.
- iii. Plantation Registers.
- iv. Nursery Registers
- v. Divisional Note Book
- vi. Boundary Registers

Control Forms: All control forms and Compartment histories shall be maintained as per the formats prescribed.

The records of all harvesting, subsidiary cultural operations, regeneration works and soil and moisture conservation works carried out as per this working plan prescriptions, will be maintained in the control forms. The prescribed proforma of the control forms have been given in the Volume II of **Appendix No. L**. Two sets of control forms will be prepared. One set will be kept in the division office and the other set will be submitted to the Conservator of Forests Working Plan Nagpur. The Forms will be sent annually by the Deputy Conservator of Forests Gondia Division to the Conservator of Forests Working Plan Nagpur not later than October, 1st. every year taking the necessary entries. All entries showing the deviations from the prescriptions will be underlined in red. The Conservator of Forests, Working Plan, Nagpur will scrutinise it and process further.

18.2 COMPARTMENT HISTORY:

Compartment histories i.e. the records of various forestry activities and observations made in the past year will be maintained in Forms prescribed in **Appendix No. LI**. Each Compartment must have a separate file for its records. Compartment history must be maintained in the office of Gondia Forest Division since they keep the record of past management practices and their effects on the growing stocks.

Every year, in July, the Range Forest Officer should fill in the necessary information and will send it to Dy.C.F.Gondia Forest Division for scrutinizing, editing through ACF in

charge, who after doing so will get them typed and sign them. One copy of the forms will be sent to DyCF, Working Plan for scrutiny.

18.3 PLANTATION AND NURSERY REGISTERS: Plantation registers will be maintained for all the areas regenerated artificially as per established departmental procedures.

18.4 DIVISIONAL NOTE BOOK: At divisional level all important matters will be recorded by the DCF every year with his explicit opinions about the working plan operations. A brief note about the plantation will also be recorded by the DCF under appropriate heads.

18.5 FIRE RECORDS: They should be maintained as per the latest orders from State Government from time to time.

18.6 OTHER RECORDS: List of amendments to the working plan and list of area changes will be maintained in prescribed forms.