

Result of Sample Tree Enumeration of Dhule Forest Division

Forest Area:-According to Management & Legal Status, the following are the total Forest area of Dhule Forest Division is as under.

Table No-1
Classification of Forest area according to Management & Legal status
(Area in Sq. km.)

Sr. No.	Controlling Agency	Reserved forest	Protected forest	Un-classed forest	Total
1.	Area in charge of Forest Deptt.	1886.38	4.86	19.15	1910.39
2.	Area in charge of F.D.C.M.	---	---	---	---
3.	Private Forest brought under possession of Forest Deptt.	---	---	---	---
4	Area in charge of Rev. Deptt.	63.58	---	---	63.58
	Total	1949.96	4.86	19.15	1973.97
	% to total forest area	98.78	0.25	0.97	100

The newly formed Dhule Forest Division consist of eight ranges namely 1) Boradi 2) Dhule 3) Kondaibarai 4) Pimpelner 5) Sakri 6) Sangvi 7) Shidkheda and 8) Shirpur . Old working Plan was written by by Shri S. H. Patil, and Working by Shri R. L. Choudhary Dy. Conservator of Forests Working Plan Division.

The forest are situated between 21⁰-04'-03" north latitude and 74⁰-49'-04" east longitude. The boundaries of the division are as follows:

North – The boundaries of Nandurbar district of Maharashtra and Badavani district of Madhya Pradesh.

South – Revenue lands of Nashik district and Jalgoan district.

West – Revenue lands of Nashik district and Gujrat state.

East – Revenue lands of Jalgoan district.

The area covered under this plan includes Boradi, Sangavi and Shirpur, ranges of the then North Dhule Forest Division and Dhule, Sakari, Shindakheda, Pimpalner and Kondaibari ranges of the then West Dhule Division. The total forest area of above 8 Ranges of Dhule Forest Division is as given in table no.2

Table No.2

Sr. No	Area of Dhule Division	Total area in (ha)
1.	Total Eight Ranges	190945.10

The Conservator of Forest, Working Plan Dhule has proposed following working circlewise forest area, for sample tree enumeration.

Table No.3

Working Circle wise Area proposed for tree enumeration

Sr. No.	Name of working circle	Population area in ha
1	Afforestation Working Circle	55500.864
2	Coppice with Reserve Working Circle	73352.155
3	Improvement Working Circle	10114.781
4	Improvement & Protection Working Circle	1639.732
5	Kuran Working Circle	6309.541
6	Protection Working Circle	3002.565
7	Selection Working Circle	1302.566
8	Selection & Protection Working Circle	364.622
9	SPWC	11094.147
	Total	162680.973

Sampling plan of Tree Enumeration

Actually the tree enumeration work was done by Dy. Conservator of Forests, Dhule Division in 2011-12. The entire forest division's area was considered for sampling enumeration plan. The trees are enumerated in girth classes started from 15-30 cms to Above 150 cms. The girth is measured at breast height (g.b.h.).

The statistical sampling method namely “Systematic Line Plot Sampling with Random Start” was used for tree enumeration. The plot size 30 meters x 30 meters, was found to be suitable with the least standard error. The complete enumeration of trees, seeding, coppices, Grass and Medicinal species were carried out in these plots. Similarly qualitative measurements were also carried out.

Scrutiny of data and preparation of results i.e. (1) Stock per hectare was calculated and the result are being reported in the form of following statements.

Statement I : Estimated growing stock- No. of Sound trees.

Statement II : Estimated growing stock- No. of Sound trees per ha.

Statement III : Percentage distribution of total stock of species over all girth classes.

Statement IV : Percentage of stock of species in a girth class to the total stock in that particular girth class.

Statement V : Estimated growing stock - volume in cubic mtr./ha

Some noteworthy result on current enumeration is described in following Table.

Table No. 4 (a)

Statement showing estimated No. of trees per ha. for Past and Current tree enumeration (2011 -12)

Sr. No	Name of Working Circle	Past enumeration	Sr. No.	Name of Working Circle	Current enumeration No. of trees per ha.
	Newly formed Division & This is 1st Enumeration		1	Afforestation W. C.	80.208
			2	Coppice with Reserve W. C.	46.920
			3	Improvement W. C.	115.214
			4	Improvement & Protection W. C.	134.758
			5	Kuran W. C.	78.429
			6	Protection W. C.	117.861

			7	SelectionCum Improv ement W.C.	264.241
			8	Selection cum Improv ement & Protect ion W. C.	318.870
			9	Selection & Protect ion W.C.	53.475
Weighted Average			Weighted Average		68.736

It is observed that the total estimated number of trees per hectare in current enumeration (2011 -12) is 68.736.

Table 4 (b)

**Estimated percentage of trees in 15 U 30 and 30 U 45 girth class,
and remaining girth class.**

Working Circle	Girth class-wise estimated percentage of number of trees (%)			
	15U30	30U45	Remaining Girth Classes	Total estimated No. of trees

Working Circle	Girth class-wise estimated percentage of number of trees (%)			
	15U30	30U45	Remaining Girth Classes	Total estimated No. of trees
Afforestation W. C.	72.839	16.936	10.225	100
Coppice with Reserve W. C.	44.849	36.436	19.564	100
Improvement W. C.	25.272	28.766	45.962	100
Improvement & Protection W. C.	14.164	79.704	6.132	100
Kuran W. C.	82.88	9.318	7.802	100
Protection W.C.	32.694	22.314	44.992	100
Selection Cum Improvement W. C.	13.41	25.683	60.907	100
Selection cum Improvement & Protection Working Circle	2.787	17.073	80.14	100
Selection & Protection W.C.	90.203	7.712	2.085	100
Weighted Average	56.868	26.342	16.790	100

Working circlewise estimated, number of sound trees per hectare are as follows.

Table No.5

No. of sound trees per ha

Sr. No.	Name of Working Circle	Total	General utility species	Special utility species	Minor forest produce species	Other species
1	2	3	4	5	6	7
1	Afforestation W. C.	80.208	4.242	14.771	13.270	47.925
	% of stock to total stock	100	5.29	18.42	16.55	59.74
2	C W.R. W.C.	46.920	7.966	6.513	21.208	11.233
	% of stock to total stock	100	16.98	13.88	45.20	23.94
3	Improvement W. C.	115.214	60.702	16.308	19.513	18.691

	% of stock to total stock	100	52.69	14.15	16.94	16.22
4	Improvement & Protection W. C.	134.76	99.430	6.268	15.100	13.960
	% of stock to total stock	100	73.78	4.650	11.21	10.36
5	Kuran W. C.	78.43	0.238	17.111	20.084	40.996
	% of stock to total stock	100	0.30	21.82	25.61	52.27
6	Protection W. C.	117.86	57.806	11.531	11.251	37.273
	% of stock to total stock	100	49.05	9.78	9.55	31.62
7	Selection W.C.	264.241	162.46	30.026	19.211	52.544
	% of stock to total stock	100	61.48	11.36	7.27	19.89
8	SCI & Prot. W.C.	318.87	259.989	26.663	0	32.218
	% of stock to total stock	100	81.53	8.36	0	10.10
9	Selection and Protection W.C.	53.475	0	9.104	7.656	36.715
	% of stock to total stock	100	0	17.03	14.32	68.66
Total weighted average		62.259	10.892	9.930	16.442	24.996
% of stock to total stock		100.00	17.49	15.95	26.41	40.15

Highlights from the results of tree enumeration as given in table No.5, are summarised below:

1) Afforestation Working Circle:

It is observed that Ain, Bondara, Teak, Bija, Shisam, Tiwas and Kakad of General utility was found in this area which is 5.29 % to the total growing stock. The species of special utility viz, Anjan, Dhawada, Khair, Hiwar, Kudi, Salai, Sawar and Shivan are 18.42 % to the total growing stock. The species of minor forest produce viz., Bor, Bel, Aola, Moha, Palas, Karwand, Neem, Tendu, Behada, Chinch, Shiras, Apta, Kawath, Ritha and Jambhul are 16.55 % to the total growing stock and rest of the species are 59.74 % to the total growing stock.

2) Coppice With Reserve Working Circle:-

It is observed that Ain, Bondara, Kakad, Teak and Tiwas of General utility was found in this area which is 16.98 % to the total growing stock. The species of special utility viz, Anjan, Dhawada, Hiwar, Kalamb, Khair, Salai and Shivan are 13.88 % to the total growing stock. The species of minor forest produce viz., Aola, Apta, Behada, Bor, Jambhul, Moha, Neem, Palas, Sitafal and Tendu are 45.20 % to the total growing stock and rest of the species are 23.94 % to the total growing stock.

3) Improvement Working Circle:-

It is observed that Ain, Bija, Bondara, Kakad, Shisam, Teak and Tiwas of General utility was found in this area which is 52.69 % to the total growing stock. The species of special utility viz, Arjun, Dhawada, Haldu, Hiwar, Kalamb, Khair, Salai, Sawar, Semal and Shivan are 14.15 % to the total growing stock. The species of minor forest produce viz., Aola, Apta, Behada, Bor, Karwand, Moha, Neem, Nilgiri, Palas, Siras and Tendu are 16.94 % to the total growing stock and rest of the species are 16.22% to the total growing stock.

4) Improvement & Protection Working Circle:-

It is observed that the species Ain, Bondara, Teak & Tiwas of General utility was found in this area which is 73.78 % to the total growing stock. The species of special utility viz. Dhawada, Khair & Shivan are 4.65% to the total growing stock. The species of minor forest produce viz. Behada, Moha, Neem & palas are 11.21 % to the total growing stock and rest of the species are 10.36 % to the total growing stock

5) Kuran Working Circle:-

It is observed that species of General utility, viz. Teak was found in this area which is 0.30 % to the total growing stock and Species of Special utility viz. Anjan, Dhawada, Hiwar and Khair are found in this area which is 21.82% to the total growing stock. The species of Minor forest produce viz. Bor,

Chinch, Neem & Palas are found which is 25.61 % to the total growing stock and rest of the species are 52.27 % to the total growing stock.

6) Protection Working Circle:-

It is observed that species of General utility viz. Ain, Bondara, Shisam, Teak & Tiwas was found in this area which are 49.05 % to the total growing stock and Species of Special utility viz. Dhawada, Khair, Salai and Shivan are found in this area which is 9.78 % to the total growing stock. The species of Minor forest produce viz. Aola, Behada, Bor, Moha, Neem and Palas was found which are 9.55 % to the total growing stock and rest of the species are 31.62% to the total growing stock.

7) Selection cum Improvement Working Circle:-

It is observed that species of General utility, viz. Ain, Bondara, Shisam, Teak & Tiwas was found in this area which is 61.48% to the total growing stock. Species of Special utility viz. Dhawada, Khair, Salai and Shivan are found in this area which is 11.36 % to the total growing stock. The species of Minor forest produce viz. Aola, Apta, Biba, Moha, Palas and Tendu was found which is 7.27 % to the total growing stock and rest of the species are 19.89% to the total growing stock.

8) Selection cum Improvement & Protection Working Circle:-

It is observed that species of General utility viz. Ain, Bondara, Shisam and Teak are found which is 81.54 % to the total growing stock. The species of Special utility are found viz. Dhawada & Khair which are 8.36 % to the total growing stock. No species of minor forest produce are found in this working circle. Rest of the species are 10.10 % to the total growing stock.

9) Selection and Protection Working Circle:-

It is observed that no species of General utility are found in this working Circle. The species, viz. Anjan, Hiwar and Khair was found as a species of Special utility which is 17.03 % to the total growing stock in this working circle.

The species of minor forest produce viz. Aola, Apta, Bel, Bor, Neem and Palas are found which is 14.32 % to the total growing stock in this working circle and rest of the species are 68.66 % to the total growing stock.

Table No.6

**Availability of Teak in previous Enumeration (Enumeration period)
As per previous Working Plan.**

Sr. No	Name Working Circle	Total growing Stock	Teak/Ha	% of stock of trees to the total stock
1	2	3	4	5
1	No previous Enumeration			
	Weighted Average	---	----	-----

Table No.6(A)

Availability of Teak (Enumeration period of 2011-12) in Current enumeration.

Sr. No	Name Working Circle	Total growing Stock	Teak/Ha	% of stock of Teak trees to the total stock
1	2	3	4	5
1	Afforestation W. C.	80.208	1.919	2.393
2	CWR W.C.	46.920	7.558	16.108
3	Improvement W.C.	115.214	29.744	25.816
4	Improvement & Protection W. C.	134.758	49.003	36.364
5	Kuran Working Circle	78.429	0.238	0.303
6	Protection W. C.	117.861	24.050	20.405
7	Selection W. C.	264.241	75.074	28.411
8	Selection cum Imp. &	318.780	88.887	27.883

	Protection W. C.			
9	Selection and Protection W.C.	53.475	0	0
Total (Weighted Average)		68.736	7.659	11.143

Estimated growing stock of Medicinal plant, Natural regeneration and grass per Ha.

Table No. 7

A) Medicinal plant, per ha (Sample plot size 5 Mtr.X 5 Mtr.)

Sr. No.	Working Circle	Population area (Ha.)	No. of sample plots	Sample area (Ha.)	No. of Medicinal Plants in sample area	No. of Medicinal Plants per Ha.(col.6/Col.5)
1	2	3	4	5	6	7
1	A.W.C.	55500.864	1407	3.51	3755	1070
2	C.W.R.	73352.155	1767	4.418	372	84
3	I.W.C.	10114.781	229	0.573	59	103
4	IWC & P.W.C	1639.732	39	0.098	0	0
5	K.W.C.	6309.541	187	0.468	506	1081
6	P.W.C.	3002.565	79	0.20	344	1720
7	S.C.I.	1302.566	37	0.092	34	369
8	S.C.I.& P.W.C	364.622	10	0.025	7	280
9	S.P.W.C	11094.147	299	0.75	237	316
	Total	162680.973	4054	10.134	5314	524

B) Natural Regeneration plant, per ha (Sample plot size 5 Mtr.X 5 Mtr.)

Sr. No.	Working Circle	Population area (Ha.)	No. of sample plots	Sample area (Ha.)	No. of NR Plants in sample area	No. of NR Plants per Ha. (col.6/Col.5)
1	2	3	4	5		7
1	A.W.C.	55500.864	1407	3.51	7560	2153
2	C.W.R.	73352.155	1767	4.418	3830	867
3	I.W.C.	10114.781	229	0.573	272	475
4	IWC & PWC	1639.732	39	0.098	0	0
5	K.W.C.	6309.541	187	0.468	349	746
6	P.W.C.	3002.565	79	0.20	184	920

7	S.C.I.	1302.566	37	0.092	123	1337
8	S.C.I.& P.W.C	364.622	10	0.025	25	1000
9	S.P.W.C	11094.147	299	0.75	715	953
	Total	162680.973	4054	10.134	13058	1288

G) Grass Species, per ha (Sample plot size 1 Mtr.X 1 Mtr.)

Sr. No.	Working Circle	Population area (Ha.)	No. of sample plots	Sample area (Ha.)	No. of Grass roots in sample area	No. of Grass roots per Ha. (col.6/Col.5)
1	2	3	4	5	6	7
1	A.W.C.	55500.864	1407	0.141	16943	120163
2	C.W.R.	73352.155	1767	0.177	15628	88299
3	I.W.C.	10114.781	229	0.023	6380	277391
4	IWC. & PWC	1639.732	39	0.004	350	87500
5	K.W.C.	6309.541	187	0.019	1020	53684
6	P.W.C.	3002.565	79	0.008	2992	374000
7	S.C.I.	1302.566	37	0.004	2510	24134
8	S.C.I.& P.W.C	364.622	10	0.001	575	575000
9	S.P.W.C	11094.147	299	0.030	3396	113200
	Total	162680.973	4054	0.407	49794	122343

Statistical Analysis: -

The Statistical personnel of the office of the Chief Forest Statistician, Maharashtra State, Nagpur, have carried out the statistical analysis of the data. The calculated estimates lead to certain error and percentage of Standard error is around 5% for Afforestation, Coppice with Reserve, Improvement and Kuran Working Circles in the statistical analysis. The standard error bound to be high, which itself signifies that standard error will not be a reliable measure for accurate statistical analysis for IWC & PWC, Protection, Selection Cum Improvement, SCI & PWC and S. P. Working Circle The percentage standard error is calculated for each Working Circle is given in the following table No. 8

Table No.8
Workingcirclewise percentage of Standard Error.

Sr. No.	Name of working circle	Population area in ha	Sample area in ha	Intensity of sampling %	% Standard Error
1	2	3	4	5	6
1	A.W.C.	55500.864	126.63	0.227	2.77
2	C.W.R.	73352.155	159.03	0.217	3.8
3	I.W.C.	10114.781	20.610	0.204	5.17
4	IWC. & PWC	1639.732	3.51	0.214	6.26
5	K.W.C.	6309.541	16.83	0.267	4.19
6	P.W.C.	3002.565	7.11	0.237	12.98
7	S.C.I.	1302.566	3.33	0.256	6.6
8	S.C.I.& P.W.C	364.622	0.9	0.247	6.98
9	S.P.W.C	11094.147	26.91	0.243	7.87
	Total	162680.973	364.86	--	--

**Chief Forest Statistician,
Maharashtra State, Nagpur.**