

## **Result of Sample Tree Enumeration of Parbhani Forest Division**

Parbhani forest division is one of the forest divisions of Aurangabad circle. Parbhani forest division comprises of Parbhani and Hingoli districts. The entire forest area of Parbhani division lies between 18<sup>0</sup>-50' to 20<sup>0</sup>-2' North latitude and 76<sup>0</sup>-5' to 77<sup>0</sup>-42' east longitude. The track is bounded as follows :-

North :- Buldhana and Akola Districts .

East :- Yavatmal and Nanded District.

South :- Nanded, Osmanabad and Beed District.

West :- Jalna and Beed District

**Configuration of the Ground:-** The land of the division has a general elevation of about 457.50 meters above mean sea level. The highest level being 579.73 meters above mean sea level in Jintur range about 12.87 kilometers North of Charthana and the lowest level is 366.0 meters above mean sea level on the bank of Godavari, where it crosses district boundary to enter the Nanded district. The Jintur hill range is the most prominent in the division.

**Geology, Rock and Soil:-** Parbhani district have not been geologically surveyed in sufficient details, the information available is meager. District is uniformly laid by the Deccan lava flows in the form of horizontally bedded sheets, similar to Deccan trap formation of basaltic composition.

**Climate:-** The climate of Parbhani district is generally hot except during the south west monsoon.

**Forest Area:-** According to Management & Legal Status, as per Annual Administration Report the following are the forest area figure as on dated 31/3/2014.

**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 Department	82.98	---	18.82	101.80
2.	Area in charge of F.D.C.M.	---	---	---	---
3.	Private Forest brought under possession of Forest Department	---	---	---	---
4.	Area in charge of Revenue department	---	---	---	---
Total		82.98	---	18.82	101.80
% to total forest area		81.51	---	18.49	100

Parbhani forest division consist of **one range** namely Parbhani. The area under Scientific Management as recorded in Working Plan (2006-07 to 2015-16) by Shri Samir Sahai, I.F.S. Conservator of Forests, Working Plan Division, Aurangabad is as under.

**Table No.2**

Sr. No	Name of Ranges	Total area in (ha)
1.	Parbhani	10414.60

Now Conservator of Forest, Working Plan Aurangabad, 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	4834.581
2	New Working Circle	448.408
3	Improvement Working Circle	2538.456

4	Silvipasture Working Circle	2293.624
	<b>Total</b>	<b>10115.069</b>

### **Sampling plan of Tree Enumeration**

Actually the tree enumeration work was done by Dy. Conservator of Forests, parbhani Division in 2013-14. 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 60 meters x 60 meters, was found to be suitable with the least standard error. The complete enumeration of trees, Natural regeneration, Grass and Medicinal species were carried out in these plots. Similarly qualitative measurements were also carried out.

On 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 cum./ha.

Some noteworthy result on current enumeration is described in following Table No. 4(a)

**Table No. 4 (a)**

**Statement showing estimated No. of trees per ha. for Previous (Dec -2004 to Jan-2005) and Current tree enumeration (2013-14)**

Sr. No	Name of Working Circle	Past enumeration (Dec. 2004 to Jan-2005) No. of trees per ha.	Sr. No.	Name of Working Circle	Current enumeration (2013-14) No. of trees per ha.
1	Re-afforestation cum S&M Working Circle	133.559	1	Afforestation Working Circle	50.954
2	Kuran Fodder development W.C.	140.741	2	New Working Circle	0.696
3	Improvement Working Circle	207.596	3	Improvement Working Circle	59.989
4	Miscellaneous Working Circle	15.095	4	Silvipasture Working Circle	13.416
<b>Weighted Average</b>		<b>146.875</b>	<b>Weighted Average</b>		<b>42.482</b>

It is observed that the total estimated number of trees per hectare in current enumeration (2013-14) is 42.482. It comes to know that the No. of trees decreases as compared to the previous enumeration (Dec. 2004 to Jan-2005) i.e 146.875/ha.

**Table 4 (b)**

**Estimated percentage of trees in 15 U 30 and 31 U 45 girth class.**

Working Circle	Girth class-wise estimated percentage of number of trees (%)			
	15U30	31U45	Remaining Girth Classes	Total estimated No. of trees

Working Circle	Girth class-wise estimated percentage of number of trees (%)			
	15U30	31U45	Remaining Girth Classes	Total estimated No. of trees
Afforestation Working Circle	83.97	7.524	8.506	100
New Working Circle	100	0	0	100
Improvement Working Circle	70.713	18.162	11.125	100
Silvipasture Working Circle	99.188	0.812	0	100
<b>Weighted Average</b>	<b>84.804</b>	<b>8.338</b>	<b>6.858</b>	<b>100</b>

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

**Table No.5**

**Working Circlewise 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 Working Circle	50.954	11.857	9.557	20.670	8.870
	% of stock to total stock	100.00	23.27	18.76	40.57	17.40
2	New Working Circle	0.696	0	0	0.696	0
	% of stock to total stock	100.00	0	0	100	0
3	Improvement Working Circle	59.989	12.085	12.337	13.996	21.571
	% of stock to total stock	100.00	20.15	20.57	23.33	35.96
4	Sivipasture Working Circle	13.416	2.74	2.669	6.286	1.719
	% of stock to total stock	100	20.44	19.89	46.86	12.81
Total weighted average		42.482	9.322	8.269	14.848	10.043
% of stock to total stock		100.00	21.94	19.47	34.95	23.64

**Table No.5A**

**Working Circlewise Volume in cum. 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 Working Circle	5.439	0.605	1.676	2.145	1.013
	% of stock to total stock	100.00	11.120	30.820	39.440	18.620
2	New Working Circle	0.073	0	0	0.073	0
	% of stock to total stock	100.00	0	0	100	0
3	Improvement Working Circle	7.141	0.478	2.774	1.609	2.280
	% of stock to total stock	100.00	6.690	38.850	22.530	31.930
4	Silvipasture.Working Circle	1.185	0.116	0.280	0.608	0.181
	% of stock to total stock	100.00	9.790	23.630	51.310	15.270
Total weighted average		4.664	0.435	1.561	1.57	1.097
<b>% of stock to total stock</b>		<b>100.00</b>	<b>9.33</b>	<b>33.47</b>	<b>33.68</b>	<b>23.52</b>

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

**1) Afforestation Working Circle:-**

Catagorywise percentage of Species to total growing stock in this working circle is as given below

Sr. No.	Category of Species	Name of Species	% to total growing stock
1	A:- Species of General Utility	Bondara, Teak	23.27
2	B:-Species of Special Utility	Dhawada, Hiwar, Khair, Moin, Salai.	18.76
3	C:-Species of Minor Forest Produce	Apta, Behada, Biba, Bor, Neem, Palas, Tendu.	40.57
4	D:-Other Species	Babhul, Bahala, Bardoli, Bhutekas, Chinchordi,Dahikhada, Dhamoda,	17.40

		Dudhi, Lokhandi, Medsheng, Prosopis, Roda, Rohita, Sadoda.	
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## 2) New Working Circle:-

Catagorywise percentage of Species to total growing stock in this working circle is as given below

Sr. No.	Category of Species	Name of Species	% to total growing stock
1	A:- Species of General Utility	Nil	0
2	B:-Species of Special Utility	Nil	0
3	C:-Species of Minor Forest Produce	Neem and Palas	100
4	D:-Other Species	Nil	0

## 3) Improvement Working Circle:-

Catagorywise percentage of Species to total growing stock in this working circle is as given below

Sr. No.	Category of Species	Name of Species	% to total growing stock
1	A:- Species of General Utility	Bondara and Teak	20.15
2	B:-Species of Special Utility	Dhawada, Hiwar, Moin,Salai.	20.57
3	C:-Species of Minor Forest Produce	Behada, Char, Neem, Palas, Tendu.	23.33
4	D:-Other Species	Amtti, Babhul, Bahala, Bartondi, Bekhadi, Bhutekas, Chinchordi,	35.96

		Dhamoda, Dhas, Dudhi, Lokhandi, Medsheng, Rohita, Sadoda, Sheda	
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**4) Silvipasture Working Circle:-**

Catagorywise percentage of Species to total growing stock in this working circle is as given below

Sr. No.	Category of Species	Name of Species	% to total growing stock
1	A:- Species of General Utility	Bondara, Lendia, Teak.	20.44
2	B:-Species of Special Utility	Dhawada, Hiwar.	19.89
3	C:-Species of Minor Forest Produce	Neem, Palas, Tendu.	46.86
4	D:-Other Species	Babhul Bahala, Bardoli, Bhutekas, Dhamoda, Dudhi, Maharukh, Sadoda.	12.81

**Table No.6**

**Availability of Teak in Previous ( Dec. 2004 to Jan. 2005) Enumeration (No. of sound trees per ha.)**

Sr. No	Name Working Circle	Total growing Stock	Teak/Ha	% of stock of trees to the total stock
1	2	3	4	5
1	Re-afforestation cum S&M Working Circle	133.559	14.513	10.866
2	Kuran Fodder development W.C.	140.741	4.63	3.290
3	Improvement Working Circle	207.596	39.949	19.244
4	Miscellanenous Working Circle	15.095	4.245	28.122
	<b>Weighted Average</b>	<b>146.875</b>	<b>20.644</b>	<b>14.06</b>

**Table No.6(A)**

**Availability of Teak in Current (2013-14) enumeration. (No. of sound trees per ha.)**



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 Working Circle	50.954	8.561	16.801
2	New Working Circle	0.696	0	0
3	Improvement Working Circle	59.989	9.668	16.116
4	Silvipature W.C.	13.416	1.828	13.626
Total (Weighted Average)		42.482	6.933	16.320

**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.
1	2	3	4	5	6	7
1	A.W.C.	4834.581	134	0.335	12	36
2	New W.C.	448.408	12	0.03	10	333
3	Improvement W.C.	2538.456	77	0.1925	2	10
4	Silvipasture W.C.	2293.624	76	0.19	0	0
	Total	10115.069	299	0.7475	24	32

Working Circle wise name of species of Medicinal Plants found in sample plot are as follows.

Sr. No.	Working Circle	Name of species of Medicinal Plants
1	2	3
1	A.W.C.	Jakhamjudi, Tantani, Tarota, Unhali.
2	New W.C.	Jakhamjudi, Rantulas, Unhali.
3	Improvement W.C.	Jakhamjudi

4	Silvipasture W.C.	NIL
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**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 Regenerated Plants in sample area	No. of Regenerated Plants per Ha.
1	2	3	4	5	6	7
1	A.W.C.	4834.581	134	0.335	5	15
2	New W.C.	448.408	12	0.03	73	2433
3	Improvement W.C.	2538.456	77	0.1925	8	42
4	Silvipasture W.C.	2293.624	76	0.19	3	16
	Total	10115.069	299	0.7475	89	119

Working Circle wise name of species of Natural regeneration found in sample plot are as follows.

Sr. No.	Working Circle	Name of species of Natural Regeneration
1	2	3
1	A.W.C.	Dhamoda, Teak.
2	New W.C.	Bartondai, Chandanbor, Dhamoda, Dhawada, Dudhi, Hiwar, Khair, Moi, Palas, Sadada, Teak, Tendu.
3	Improvement W.C.	Dhamoda, Palas.
4	Silvipasture W.C.	Dhamoda, Palas.

**C) 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.
1	2	3	4	5	6	
1	A.W.C.	4834.581	134	0.0134	1678	125224
2	New W.C.	448.408	12	0.0012	4106	3421667

3	Improvement W.C.	2538.456	77	0.0077	314	40779
4	Silvipasture W.C.	2293.624	76	0.0076	34	4474
	<b>Total</b>	<b>10115.069</b>	<b>299</b>	<b>0.0299</b>	<b>6132</b>	<b>205084</b>

Working Circle wise name of species of Grass Species found in sample plot are as follows.

Sr. No.	Working Circle	Name of Grass Species
1	2	3
1	A.W.C.	Gondali, Kunda, Kusali, Marvel, Pawanya.
2	New W.C.	Gondalai, Kusali, Pawanya.
3	Improvement W.C.	Gondalai, Kunda, Kusali, Pawanya.
4	Silvipasture W.C.	Gondalai, Kusali, Pawanya.

### **Statistical Analysis: -**

The Statistical personnel of the office of the Chief Forest Statistician, Maharashtra State, Nagpur has carried out the statistical analysis of the data. The percentage standard error is calculated for each Working Circle is given in the following table No. 8

**Table No.8**  
**Working circlewise standard error**

Sr. No.	Name of working circle	Population area in ha	Sample area in ha	Intensity of sampling %	% Standard Error
1	Afforestation Working Circle	4834.581	48.24	0.998	12.72
2	New W. Circle	448.408	4.32	0.963	---
3	Improvement W.C.	2538.456	27.72	1.092	18.76
4	Silvipasture W.C.	2293.624	27.36	1.193	22.22
	<b>Total</b>	<b>10115.069</b>	<b>107.64</b>	<b>---</b>	<b>----</b>

**Chief Forest Statistician,**

**Maharashtra State, Nagpur.**



