

Result of Sample Tree Enumeration of Gadchiroli Forest Division

Gadchiroli forest division is one of the forest divisions of Gadchiroli circle. The forest extends over an area of 2203.08 sq. kms. Gadchiroli division is situated in the middle part of Gadchiroli District.

Climate:- The weather remains hot and dry for the major part of the year. The highest and lowest temperature recorded are 46.46⁰ C in summer and 7⁰C in winter respectively.

Description of the Forests:- The forest belongs to the group “Tropical Dry Forests” and subgroup “5A/C3-Southern Tropical Dry Deciduous Forest.

Forest Area:- In view of Management & Legal Status, as per Annual Administration Report, the details of forest area of Gadchiroli Division as on dated 31/3/2017 are as follows.

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 Forest
1.	Area in charge of Forest Department	1851.13	281.70	34.41	2167.24
2.	Area in charge of F.D.C.M.	28.02	---	---	28.02
3.	Private Forest brought under possession of Forest Department	---	---	---	---
4	Area in charge of Revenue department	---	---	7.82	7.82
Total		1879.15	281.70	42.23	2203.08
% to total forest area		85.30	12.79	1.91	100

Gadchiroli forest division consist of 9 Ranges. The Range wise Forest area under Scientific Management as recorded in Working Plan (2007-08 to 2016-17) by Shri K. Narsimhalu, IFS, Conservator of Forests Working Plan Division 1 Chandrapur is as under.

Table No.2

Sr. No	Name of Ranges	Total Forest area in (ha)
1.	Kunghada	24678.51
2.	Potegaon	20388.05
3.	Gadchiroli	22649.07
4.	Chatgaon	25567.90
5	Pendhari	34879.62
6	Dhanora North	22369.14

7	Dhanora South	24788.56
8	Murumgaon East	22553.78
9	Murumgaon West	21536.86
	Total	219411.49

Now Conservator of Forest, Working Plan Gadchiroli, has proposed following working circle wise 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	27867.04
2	Selection Cum Improvement Working Circle	103556.14
3	Improvement Working Circle	76107.13
4	Fodder Development Working Circle	10313.96
	Total	217844.27

Sampling plan of Tree Enumeration

Actually the tree enumeration work was done by Working Plan, Gadchiroli Division during Feb-2015 to Feb-2016. The entire forest division's area was considered for sampling enumeration plan. The trees are enumerated in girth classes started from 31-45 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 50"x50" (50 seconds x 50 seconds) i.e. 225 ha. In each plot of 225 ha. 0.1 ha. plot was enumerated. 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 in population area.

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. in Previous (Oct 2004 to June 2006) and Current (Feb-2015 to Feb-2016) tree enumeration

Sr. No	Name of Working Circle	Past enumeration (Oct-2004 to June-2006) No. of trees per ha.	Sr. No.	Name of Working Circle	Current enumeration (Feb-2015 to Feb-2016) No. of trees per ha.
1	Afforestation Working Circle	469.91	1	Afforestation Working Circle	140.75
2	Selection Cum Improvement Working Circle	530.68	2	Selection Cum Improvement Working Circle	239.50
3	Improvement Working Circle	507.59	3	Improvement Working Circle	235.39
4	Grass Working Circle	428.87	4	Fodder Development Working Circle	114.24
Weighted Average		510.10	Weighted Average		219.50

It is observed that the total estimated number of trees per hectare in current enumeration (Feb-2015 to Feb-2016) is decreased as compared to previous (Oct-2004 to June-2006) tree enumeration.

Table 4 (b)

Estimated percentage distribution of trees in 15 U 30 and 31 U 45 and remaining girth class to overall girth class

Working Circle	Girth class-wise estimated percentage of number of trees (%)			
	15U30	31U45	Remaining Girth Classes	Total estimated No. of trees
Afforestation Working Circle	0	31.69	68.31	100
Selection Cum Improvement Working Circle	0	24.04	75.96	100
Improvement Working Circle	0	25.73	74.27	100
Fodder Development Working Circle	0	25.68	76.70	100
Weighted Average	--	25.57	74.43	100

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	140.75	43.45	50.65	22.40	24.25
	% of stock to total stock	100	30.87	35.99	15.92	17.23
2	Selection Cum Improvement Working Circle	239.50	59.80	89.18	42.33	48.19
	% of stock to total stock	100	24.97	37.24	17.67	20.12
3	Improvement Working Circle	235.39	56.93	99.65	37.83	40.99
	% of stock to total stock	100	24.18	42.33	16.07	17.41
4	Fodder Development Working Circle	114.24	32.12	37.61	20.15	24.37
	% of stock to total stock	100	28.11	32.92	17.63	21.33
Total weighted average		219.50	55.39	85.47	37.16	41.49
% of stock to total stock		100	25.24	38.94	16.93	18.90

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	48.21	17.14	12.00	10.39	8.68
	% of stock to total stock	100	35.56	24.89	21.55	18.00
2	Selection Cum Improvement	94.06	32.69	24.63	20.19	16.55
	% of stock to total stock	100	34.75	26.19	21.46	17.60
3	Improvement Working Circle	80.16	24.66	26.52	15.94	13.04

	% of stock to total stock	100	30.76	33.08	19.89	16.27
4	Fodder Development Working Circle	41.65	12.50	11.91	10.08	7.18
	% of stock to total stock	100	30.00	28.58	24.19	17.23
Total weighted average		80.85	26.94	23.07	16.97	13.87
% of stock to total stock		100	33.31	28.54	20.99	17.16

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	Ain, Bija, Lendia, Shisam, Teak.	30.87
2	B:-Species of Special Utility	Bherra, Dhawada, Garadi, Haldu, Hiwar, Kalamb, Khair, Salai, Semal. Shivan	35.99
3	C:-Species of Minor Forest Produce	Apta, Awala, Behada, Bel, Biba, Char, Hirda, Jambhul, Moha, Neem, Palas, Tendu.	15.92
4	D:-Other Species	Amaltas, Ghogar, Kirmira, Kuda, Kumbhi, Kusum, Lokhandi, Mokha, Pimpal, Rohan, Umbar, Others	17.23

2) Selection Cum 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	Ain, Bija, Lendia, Shisam, Teak, Tiwas	24.97
2	B:-Species of Special Utility	Arjun, Bherra, Dhawada, Garadi, Haldu, Hiwar, Kalamb, Karai, Khair, Salai, Sawar, Semal. Shivan	37.24
3	C:-Species of Minor Forest Produce.	Apta, Awala, Behada, Bel, Biba, Char, Chinch, Hirda, Jambhul, Moha, Neem, Palas, Tendu.	17.67
4	D:-Other Species	Amaltas, Ghogar, Karanj, Kuda, Kumbhi, Kusum, Lokhandi, Mokha, Pangara, Pimpal, Rohan, Wad, Others	20.12

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	Ain, Bija, Lendia, Shisam, Teak, Tiwas	24.18
2	B:-Species of Special Utility	Arjun, Bherra, Dhawada, Garadi, Haldu, Hiwar, Kalamb, Karai, Khair, Salai, Sawar, Semal. Shivan	42.33
3	C:-Species of Minor Forest Produce	Amba, Apta, Awala, Behada, Biba, Char, Hirda, Jambhul, Moha, Neem, Palas, Tendu.	16.07
4	D:-Other Species	Amaltas, Ghogar, Karanj, Kuda, Kumbhi, Kusum, Lokhandi, Mokha, Pangara, Pimpal, Rohan, Others	17.41

4) Fodder Development 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	Ain, Bija, Lendia, Shisam, Teak	28.11
2	B:-Species of Special Utility	Arjun, Bherra, Dhawada, Garadi, Haldu, Hiwar, Kalamb, Karai, Khair, Salai, Semal.	32.92
3	C:-Species of Minor Forest Produce	Apta, Behada, Biba, Char, Hirda, Moha, Palas, Tendu	17.63
4	D:-Other Species	Amaltas, Ghogar, Kumbhi, Kusum, Lokhandi, Mokha, Rohan, Others	21.33

Table No.6

Availability of Teak in Previous (Oct-2004 to June-2004) Enumeration in (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	Afforestation Working Circle	469.91	27.27	5.80
2	Selection Cum Improvement Working Circle	530.68	21.91	4.13
3	Improvement Working Circle	507.59	15.27	3.01
4	Grass Working Circle	428.87	14.40	3.36
	Weighted Average	510.10	19.91	3.90

Table No.6 (A)
Availability of Teak in Current (Feb-2015 to Feb-2016) 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	140.75	4.75	3.38
2	Selection Cum Improvement Working Circle	239.50	6.36	2.65
3	Improvement Working Circle	235.39	6.25	2.66
4	Fodder Development Working Circle	114.24	1.69	1.48
Total (Weighted Average)		219.50	5.89	2.69

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. 7

Table No.7
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 W.C.	27867.040	20.00	0.072	7.7
2	Selection Cum Improvement W.C.	103556.140	51.30	0.050	3.02
3	Improvement W.C.	76107.130	38.70	0.051	3.84
4	Fodder Development W. C.	10313.960	07.10	0.069	14.65
	Total	217844.270	117.10	0.054	--

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

