

Result of Sample Tree Enumeration of Mewasi Division

Mewasi forest division is the one of the forest divisions of Dhule circle. The headquarter is at Taloda. The entire forest area of Mewasi division lies between $73^{\circ}46'42''$ to $74^{\circ}22'30''$ East longitude and $21^{\circ}29'50''$ to $21^{\circ}43'53''$ North latitude. The track is bounded as follows :-

North :- Rivers Narmada and Tapi

East :- Akrani Mahal and Shahada talukas of Dhule district

South :- Rivers Narmada and Tapi

West :- Rajpipala district of Gujrat State

Configuration of the Ground:- The Satpudas, a broad belt of mountain land stretching in a wall-like manner on the Northern side of the Tapi, rise from the first range of hills, ridge behind ridge to the central ridge to a height of about 600 meters above sea level, and then slope down rather steeply towards the Narmada amongst these, two ranges of relatively higher elevation than the rest are discernible. These two ranges of hills unite at Toranmal and enclose an irregular table and, about 50 km. long and 25 km. broad between their North and South faces. The whole surface of the region is very much rugged ranging in height from 300m. To 600m. from mean sea level.

Geology, Rock and Soil:- Deccan trap covers almost the whole area except a few narrow strip of alluvium on both sides of major streams. These trap rocks are the result of outpouring on enormous lava flows which spread over vast areas of western, central, and southern India at the close of the mesozoic area. The traps of the hills along the northern boundry of the district have generally low northerly dip, but it is not very regular.

Climate:- Drought is uncommon in this area since ground water availability is very good.

Forest Area:- According to Management & Legal Status, as per Annual Administration Report the following are the forest area figure as on dated 31/3/2016.

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	206.87	0.04	0	206.91
2.	Area in charge of F.D.C.M.	47.17	0	0	47.17
3.	Private Forest brought under possession of Forest Department	418.22	0	0	418.22
4	Area in charge of Revenue department	5.41	0	0	5.41
Total		677.67	0.04	0	677.71
% to total forest area		99.99	0.01	----	100%

Previous Working Plan of Mewasi Forest Division consist of Working Circles namely 1) Selection cum Improvement Working Circle 2) Protection Working Circle 3) Coppice with Reserve Working Circle. 4) Afforestation Working Circle and 5) Improvement Working Circle

The area proposed for tree enumeration in previous Working Plan (2001-02 to 2010-11) by Shri S.H. Patil, Dy. Conservator of Forests, Working Plan Division, Dhule was as under.

Table No.2

Sr.No.	Name of Working Circle	Area in Ha.
1	Selection Cum Improvement W. C.	7300.12
2	Protection Working Circle	7620.71
3	Coppice With Reserve Working Circle.	3313.12
4	Afforestation Working Circle	27073.92
5	Improvement Working Circle	18914.41

Total	64222.28
-------	----------

Now Conservator of Forest, Working Plan Nashik, 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	26491.010
2	Improvement Working Circle	11854.590
3	Protection Working Circle	22077.290
	Total	60422.890

Sampling plan of Tree Enumeration

Actually the tree enumeration work was done by Conservator of Forests, (Working Plan) Nashik in April 2012 to April-2014. 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. 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. for Previous (January 1995 to June 1995) and Current tree enumeration (April-2012 to April-2014)

Sr. No	Name of Working Circle	Past enumeration (Dec 2003) No. of trees per ha.	Sr. No.	Name of Working Circle	Current enumeration (April 2012-to April-2014) No. of trees per ha.
A) Taluka -Taloda			1	Afforestation Working Circle	15.989
1	Selection Cum Improvement W.C.	147.00	2	Improvement Working Circle	15.801
2	Protection W.C.	142.85	3	Protection Working Circle	11.621
3	Coppice With Reserve W.C.	119.41	Weighted Average		14.36
B) Taluka - Akkalkuwa					
4	Afforestation W.C.	58.95			
5	Improvement W.C.	115.53			
6	Protection W.C.	135.10			
Weighted averawge		98.58			

It is observed that the total estimated number of trees per hectare in current enumeration (April-2012 to April-2014) is 14.36/ha. It comes to know that the No. of trees decreases as compared to the previous enumeration (January 1995 to June 1995) i.e 98.58/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
Afforestation W. C.	32.010	28.276	39.714	100
Improvement W.C.	34.871	26.378	38.751	100
Protection W.C.	38.585	27.769	33.646	100
Weighted Average	34.974	27.718	37.308	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	15.989	7.709	1.028	5.073	2.179
	% of stock to total stock	100.00	48.21	6.43	31.73	13.63
2	Improvement Working Circle	15.801	8.236	0.777	3.879	2.909
	% of stock to total stock	100.00	52.12	4.92	24.55	18.41
3	Protection Working Circle	11.621	6.586	2.248	1.313	1.474
	% of stock to total stock	100.00	56.67	19.34	11.30	12.69
Total weighted average		14.37	7.40	1.43	3.47	2.07
% of stock to total stock		100.00	51.56	9.93	24.14	14.37

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	2.883	0.965	0.201	1.075	0.642
	% of stock to total stock	100.00	33.470	6.970	37.290	22.270
2	Improvement Working Circle	2.912	1.042	0.175	0.937	0.758
	% of stock to total stock	100.00	35.780	6.010	32.180	26.030
3	Protection Working Circle	1.668	0.655	0.256	0.377	0.380
	% of stock to total stock	100.00	39.270	15.350	22.600	22.780
Total weighted average		2.445	0.867	0.216	0.793	0.569
% of stock to total stock		100.00	35.46	8.83	32.43	23.28

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, Bondara, Kakad, Sajad, Shisam, Teak, Tiwas	48.21
2	B:-Species of Special Utility	Arjun, Dhawada, Haldu, Hed, Hiwar, Kalamb, Khair, Kuda, Salai, Sawar, Shiwan	6.43

3	C:-Species of Minor Forest Produce	Amba, Apta, Awala, Bel, Bor,Char, Hirda, Jambhul, Kaju, Moha, Neem, Nilgiri, Palas, Shiras, Sitaphal, Tendu	31.73
4	D:-Other Species	Akeshiya, Aal, Alive, Asan, Bahawa,Bhutakesa, Bhutyapalas, Dhaman, Dudhkudi, Humb, Kumbai, Modal etc.	13.63

2) 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,Bondara,Kakad, Sajad, Shisam, Teak, Tiwas.	52.12
2	B:-Species of Special Utility	Arjun, Dhawada, Haldu, Hed, Hiwar, Kalamb, Khair, Salai, Sawar, Shiwan	4.92
3	C:-Species of Minor Forest Produce	Amba, Apta, Awala, Behada, Bel, Bor,Char, Jambhul, Moha, Neem, Nilgiri, Palas, Shiras, Sitpaphal, Tendu.	24.55
4	D:-Other Species	Asan,Bhutyapalas,Humb,Dudhk udi, Modal, Sisu etc.	18.41

3) Protection 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,Bondara,Kakad,Sajad, Shisam, Teak, Tiwas.	56.67
2	B:-Species of Special Utility	Arjun, Dhawada, Hed, Hiwar, Kalamb, Khair, Kudi, Salai, Sawar, Shiwan.	19.34
3	C:-Species of Minor Forest Produce	Amba, Apta, Awala, Behada, Bel, Char, Jambhul, Moha, Neem, Palas, Shiras, Sitpaphal, Tendu.	11.30
4	D:-Other Species	Asan,Bahava,Bhutkesa,	12.69

	Dhaman,Fashi, Humb, Karanj, Modal, Papada, Sisu,Umber,Other.	
--	---	--

Table No.6
Availability of Teak in Previous (Dec. 2003) Enumeration

Sr. No	Name Working Circle	Total growing Stock per ha.	Teak/Ha	% of stock of trees to the total stock
1	2	3	4	5
1	Selection cum Improvement W.C.	147.00	49.33	33.55
2	Protection W.C.	142.85	39.40	27.59
3	Coppice with reserve W.C.	119.41	47.08	39.42
4	Afforestation W.C.	58.95	16.28	27.62
5	Improvement W.C.	115.53	34.01	29.51
6	Protection W.C.	135.10	57.92	42.36
	Weighted Average	98.58	29.95	30.38

(Working Circles mentioned in Sr. No. 1 to 3 were fallimng in Taloda Taluka and in Sr. No. 4 to 6 were falling in Akkalkuwa Taluka)

Table No.6(A)
Availability of Teak in Current (April-2012 to April-2014) 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 Working Circle	15.989	6.972	43.61
2	Improvement W.C.	15.801	6.816	43.14
3	Protection W.C.	11.621	5.703	49.08
	Total (Weighted Average)	14.356	6.476	45.12

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	No. of Medicinal Plants per Ha.
---------	----------------	-----------------------	---------------------	-------------------	----------------------------	---------------------------------

					sample area	
1	2	3	4	5	6	7
1	A.W.C.	26491.010	741	1.85	557	301
2	I.W.C.	11854.590	337	0.84	370	439
3	P. W .C.	22077.290	600	1.50	100	67
	Total	60422.890	1678	4.195	1027	245

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.	Alive, Askand, Awala, Behada, Bel, Bahawa, Bhuiiringni, Burandi, Dhawada, Dhayti, Dudhkudi, Dudhali, Galmani, Gugul, Gulchura, Hirda, Jangli kand, Jangli kela, Kadukand, Kangni, Kawalakand, Khadkya, Kudai, Lepti, Modal, Morisawel, Moya, Palas, Pawalya, Rajhans, Rantulas, Ratadi, Sadada, Tantani, Tarota, Tembhurni, Ulasa, Umber, Waras
2	I. W.C.	Agata, Agra, Awala, Bahava, Bel, Bhuiiringni, Dagadroptya, Devkudi, Dhyati, Dudhkudi, Gadadi, Lali, Moya, Palas, Parkodi, Pawanya, Rantulas, Sarki, Shengwa, Sitaphal, Tantani, Tarota, Tembhurni.
3	P. W .C.	Aghada, Behada, Chandrajyot, Dudhkudi, Gokharu, Kalikudi, Katali, Kudi, Kumbharaiwel, Moya, Palas, Pathadi, Rantulas, Tantani.

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.	26491.010	741	1.85	1880	1015
2	I.W.C.	11854.590	337	0.84	1782	2115
3	P.W.C.	22077.290	600	1.50	839	559
	Total	60422.890	1678	4.195	4501	1073

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.	Akhun, Aal, Ain, Alive, Amba, Apta, Babhul, Bahawa, Banga, Behada, Bhutakesh, Bondara, Bor, Bovara, Chamel, Chandrajyot, Dahikudi, Dhawada, Gangutai, Gohiya, Gultura, Henkal, Hit, Jambhul, Kakad, Kalamb, Kesara, Khair, Kinni, Kudisawar, Kudi, Modal, Moha, Nilgiri, Padav, Palas, Papada, Payar, Pipri, Rekwi, Sadada, Salai, Shisam, Shivan, Sitaphal, Teak, Tendu, Tiwas, Umber, Warul
2	I.W.C.	Aal, Ain, Akhand, Apta, Aranya, Awala, Behada, Bel, Bondar, Dhawada, Dudhkudi, Kalamb, Khair, Kudi, Maharukh, Modal, Moha, Nilgiri, Palas, Papada, Sadada, Shisam, Sitaphal, Teaik, Tendu, Tiwas, Umber.
3	P.W. .C.	Ain, Aal, Bahawa, Bel, Bondara, Bor, Budzudpe, Dhawada, Dudhkudi, Gulyapalas, Jambhul, Kalamb, Karaj, Khair, Kudi, Neem, Palas, Papada, Sadada, Salai, Sitaphal, Teak, Tendu, Tiwas.

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	7
1	A.W.C.	26491.010	741	0.074	1627	21957
2	I.W.C.	11854.590	337	0.034	913	27092
3	P.W. .C.	22077.290	600	0.060	2911	48517
	Total	60422.890	1678	0.1678	5451	32485

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

Sr. No.	Working Circle	Name of Grass Species
1	2	3
1	A.W.C.	Kalikusali, Sheda, Moya, Pawanya, Kusali, Kunda, Dhayati, Sheda, Tarota, Gondal, Pandharibhoti, Safedghatali, Fulora, Lalburandi, Kaskuiri, Chilkor, Agra, Kurdu, Pawada, Nagari, Dati, Harali, Chiknya, Kohada, Soplya, Ganya, Lavali, Ratad, Dhomsa, Khodka, Hiragawat.etc.
2	I.W.C.	Pawanya, Moya, Taprya, Lalbhatadi, Kalikusali, Fulora, Safedghatali, Gondala, Fulsari, Samira, Malmal, Burandi, Chimanchara, Lalbharadi, Tulsi, Gathya, Sarakhi, etc.
3	P. W.C.	Agra, Dudhya, Moya, Safedbhatali, Pawanya, Kathali, Pawadya, Karteli, Sheda, Jadya, etc.

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	26491.01	266.76	1.01	11.98%
2	Improvement W. Circle	11854.59	121.32	1.02	13.04%
3	Protection W.C.	22077.29	216.00	0.98	8.57%
		60422.89	604.08	1.00	

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

