

Result of Sample Tree Enumeration of Shahapur Division

Shahapur forest Division is the one of the forest divisions of Thane Circle. It's civil district is Thane. The entire forest area of Shahapur Division lies between 19⁰-18' to 19⁰-46' North Latitude and 73⁰-12'to73⁰-48' East Longitude.

The track is bounded as follows:-

North :- Jawhar Forest Division .

East :- Nashik and Ahmadnagar Districts.

South :- Thane Forest Division.

West :-Wildlife Thane and Thane Forest Divisions.

Configuration of the Ground:- The tract is hilly and at places precipitous.

These hills form the outer Ranges of Sahyandries i.e. Western Ghats, which run along the Eastern boundary of Thane through Nane Ghat on the border of Pune District. Some well known peaks in the area are Ajoba Hill, Bhatgad Hill and Mahuli Fort.

Geology, Rock and Soil:- The main geological formation in the tract are:-

- i) Sub-Recent - Recent Soil
- ii) Pleistocene - Recent Laterite.
- iii) Upper Cretaceous - Eocene Deccan trap.

Climate:- The climate is hot and humid with temperatures varying between a minimum of 12⁰ C and maximum of 45⁰ C. The climate is pleasant, cool with low humidity during the winter month of November to February. Summer months from March to June are very warm.

The Forests:- The Forest can be grouped under the following forest types as per the “Revised classification of Indian Forest Types ” by Champion and Seth

Sr.No.	Type	Forest Type Description
1	3B/C1	Tropical Southern Moist Teak bearing Forests
2	3B/C2	Tropical Southern Moist Mixed Deciduous Forests
3	8A/C2	Western Sub-Tropical Hill Forests.

Result of Sample tree Enumeration of Bhore Sub Division

Forest Area:-According to Management & Legal Status, the The total forest are of Reserved Forest, Protected Forest, Acquired Forest land unclassified Forest of Shahapur Division, Thane District is as under.(figure as per A.A.R. 2011-12)

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	386.39	210.47	0.01	596.87
2.	Area in charge of F.D.C.M.	---	---	---	---
3.	Private Forest brought under possession of Forest Department	4.28	---	---	4.28
4	Area in charge of Revenue department	---	---	---	----
	Total	390.67	210.47	0.01	601.15
	% to total forest area	64.99%	35.01%	0%	100

The Shahapur Division consist of Six ranges namely 1) Vihigaon 2) Washala 3) Dolkhamb 4) Dhasai 5) Khardi and 6) Shahapur.

The area under Scientific Management as recorded in Working Plan by Dr. Devendranath / Mafiul Hussain/ P.R.Yeole/V.K. Walke, Dy. Conservator of Forests Working Plan Division Dahanu for the period 2002-03 to 2011-12 is as under.

Table No.2

Sr. No.	Type of Forests	Area in (ha.)
1	Reserved Forests	40711

2	Protected Forests	21018
3	Acquired Forests	405
	Total	62134

The Conservator of Forest, Working Plan Thane 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	Protection Working Circle	3456.641
2	Selection Cum Improvement Working Circle	11195.578
3	Afforestation Working Circle	3019.082
4	Lake Catchment Working Circle	21619.541
5	School Forest Working Circle	1419.524
	Total	40710.366

Sampling plan of Tree Enumeration

Actually the tree enumeration work was done by Dy. Conservator of the Forest Shapur Division in 2011-12. 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, seedling, 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 mt./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 Enumeration (May 1992 to Dec-1993) and Current tree enumeration (2011 -12)

Sr. No	Name of Working Circle	Past enumeration May 1992 to Dec-1993	Sr. No.	Name of Working Circle	Current enumeration No. of trees per ha.
1	Conversion W.C.	158.92	1	Protection Working Circle	13.235
2	S.C.I.W.C.	297.90	2	Selection Cum Improvement Working Circle	160.329
3	Industrial Wood W.C.	365.31	3	Afforestation Working Circle	307.304
4	Lake Catchment W.C.	225.14	4	Lake Catchment Working Circle	131.838
5	School Forest W.C.	214.11	5	School Forest Working Circle	113.809
6	Pulpwood W.C.	119.64		-----	----
Weighted Average		218.57	Weighted Average		141.987

It is observed that the total estimated number of trees per hectare in current enumeration (2011 -12) is 141.987 decreased as compared to previous enumeration (May 1992 to Dec-1993)

Table 4 (b)

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

Sr. No.	Working Circle	Girth class-wise estimated percentage of number of trees (%)			
		15U30	30U45	Remaining Girth Classes	Total estimated No. of trees
1	Protection Working Circle	15.066	13.442	71.492	100
2	Selection Cum Improvement Working Circle	39.651	30.368	29.981	100
3	Afforestation Working Circle	51.147	24.293	24.560	100
4	Lake Catchment Working Circle	24.373	27.883	47.744	100
5	School Forest Working Circle	51.254	21.697	27.049	100
Weighted Average		28.787	28.846	42.364	100

Working circlewise estimated, numbers 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	Prot. Working Circle	13.235	2.777	2.919	1.992	5.547
	% of stock to total stock	100	20.99	22.06	15.05	41.90
2	S. C. I. Working Circle	160.329	91.372	19.190	16.905	32.862
	% of stock to total stock	100	57.00	11.97	10.54	20.50
3	Affor. Working Circle	307.304	181.135	36.285	39.529	50.354
	% of stock to total stock	100	58.94	11.81	12.86	16.39

4	Lake Catchment Working Circle	131.81	65.036	17.708	11.595	41.499
	% of stock to total stock	100	49.33	10.40	8.79	31.48
5	School Forest Working Circle	113.81	44.521	35.262	17.823	16.203
	% of stock to total stock	100	39.12	30.98	15.66	14.24
Total weighted average		141.987	74.887	16.725	14.529	35.846
% of stock to total stock		100.00	52.74	11.78	10.23	25.25

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

1) 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	2.78
2	B:-Species of Special Utility	Dhawada, Sawar	2.92
3	C:-Species of Minor Forest Produce	Aamba, Apta, Jambhul, Kadipatta, Lokhandi and Palas	1.99
4	D:-Other Species	Aaliv, Aahrun, bonda, Humb etc.	5.58

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, Bibla, Kakad and Teak	91.37
2	B:-Species of Special Utility	Dhawada, Kalamb, Khair, Sawar and Shivan	19.19
3	C:-Species of Minor Forest Produce	Aamba, Aapta, Awala, Behada, Bor, Chinch, Hirda,	16.91

		Jambhul, Moha, Narkya, Neem, Palas, and Tendu.	
4	D:-Other Species	Aadishi, Aaliv, Aamboda, Aarshi, etc.	Aadiv, Asana
			32.86

3) 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, Bibla, Kakad and Teak	181.14
2	B:-Species of Special Utility	Dhawada, Kalamb, Khair, Sawar and Shivan.	36.29
3	C:-Species of Minor Forest Produce	Aamba, Aapta, Awala, Behada, Jambhul, Moha, Nilgiri, Palas and Tendu.	39.53
4	D:-Other Species	Aadiv, Asana, Aathrun, Bonda, Chera, Dhaman, Haid, Humb etc.	50.35

4) Lake Catchment 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, Bibla, Bija, Kakad, Teak and Tiwas	65.04
2	B:-Species of Special Utility	Dhawada, Kalamb, Khair, Salai, Sawar and Shivan.	13.71
3	C:-Species of Minor Forest Produce	Aamba, Aapta, Awala, Behada, Bor, Chiku, Hirda, Jambhul, Moha, Nilgiri, Palas, and Tendu.	11.60

4	D:-Other Species	Aadiv, Aaliv, Asana, Aathru, Bahava etc.	41.50
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5) School Forest 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, Bibla, Kakad and Teak.	44.52
2	B:-Species of Special Utility	Dhawada, Kalamb, Khair, Sawar and Shivan.	35.26
3	C:-Species of Minor Forest Produce	Apata, Awala, Behada, Jambhul, Moha, Palas and Tendu	17.82
4	D:-Other Species	Aadiv, Aatron, Bonda, Haid, Humb, Karanj, Koshimb, etc.	16.203

Table No.6

Availability of Teak in previous Enumeration, Enumeration period May 1192 to Dec 1993

Sr. No	Name Working Circle	Total growing Stock	Teak/Ha	% of stock of trees to the total stock
1	2	3	4	5
1	Conversion W.C.	158.92	36.16	22%
2	S.C.I.W.C.	297.90	25.46	09%
3	Industrial Wood W.C.	365.31	44.11	12%
4	Lake Catchment W.C.	225.14	33.80	15%
5	School Forest W.C.	214.11	31.51	15%
6	Pulpwood W.C.	119.64	18.91	16%
Weighted Average		218.57	31.83	15%

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	Protection Working Circle	13.235	0	0
2	Selection Cum Improve	160.329	38.954	24.300

	ment Working Circle			
3	Afforestation Working Circle	307.304	78.124	25.420
4	Lake Catchment Working Circle	131.838	13.617	10.330
5	School Forest Working Circle	113.809	21.682	19.050
Total (Weighted Average)		141.990	24.490	14.720

**Estimated growing stock of Medicinal plant, Natural regeneration
and grass roots 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					
1	P.W.C.	3456.641	39	0.0975	4	41
2	S.C.I. W.C.	11195.578	331	0.8275	122	147
3	A.W.C.	3019.082	48	0.12	997	8308
4	L.C.W.C	21619.541	642	1.605	463	288
5	School Forest W.C.	1419.524	36	0.09	48	533
	Total	40710.366	1096	2.74	1634	596

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.
1	2					
1	P.W.C.	3456.641	39	0.0975	33	338
2	S.C.I. W.C.	11195.578	331	0.8275	1041	1258
3	A.W.C.	3019.082	48	0.12	166	1383
4	L.C.W.C	21619.541	642	1.605	471	293
5	School Forest	1419.524	36	0.09	55	611

	W.C.					
	Total	40710.366	1096	2.74	1766	644

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.
1	2	3	4	5	6	7
1	P.W.C.	3456.641	39	0.0039	188	48205
2	S.C.I. W.C.	11195.578	331	0.0331	131	3958
3	A.W.C.	3019.082	48	0.0048	6590	1372917
4	L.C.W.C	21619.541	642	0.0642	8779	136745
5	School Forest W.C.	1419.524	36	0.0036	95	26389
	Total	40710.366	1096	0.1096	15783	144005

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 of tree enumeration. The calculated estimates lead to certain error. Standard error is calculated for each Working Circle is given in the following table No. 8

Table No.8

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	P.W.C.	3456.641	14.04	0.41	54.05
2	S.C.I. W.C.	11195.578	119.16	1.06	6.80
3	A.W.C.	3019.082	17.28	0.57	12.38
4	L.C.W.C	21619.541	231.12	1.07	5.39
5	School Forest W.C.	1419.524	12.96	0.91	19.78
	Total	40710.366	394.56	0.97	

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

