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A STUDY ON COMMUNITY MANAGED DEGRADED FOREST IN SRIKAKULAM AND VIZAYNAGARAM DISTRICTS OF ANDHRA PRADESH

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ABSTRACT

Ecological study and the impact of Joint Forest Management (JFM) works in the degraded forests of Burna, Baliagam reserve forest areas at Srikakulam and Shikargangii RF at Vizaynagaram districts of Andhra Pradesh were studied. Among them 24 different species recorded at Burna RF and 11 at Baliagam RF and 14 at Shikargangii RF areas. *Terminalia tomentosa, Bridella retusa* and *Casearia elliptica, Pterocarpus* uniformly distributed over entire area (100% frequency) at Burna RF. Among 24 tree species recorded at Burna RF, *Terminalia tomentosa* is uniformly distributed over entire area (100% frequency) followed by *Bridella retusa* (80%), *Casearia elliptica* (80%). Though concentrated in some particular area only, *Wrightia tinctoria* (4.8) recorded higher density value, higher abundance (8) value and higher relative density (20.8*). Bridella retusa* (1.00) recorded higher relative abundance value followed by *Pterocarpus morsupium* (0.82). A total of 11 different tree species were observed. 8 species occupied entire area and only three species i.e. *Emblica officianalis*, *Osyris peltata* and *Xymenia Americana* found only in one quadrate with single digit number. *Diospyros sylvatica* (12.66) and *Cleistanthus collinus* (4.33) found to be having more density and abundance value. *Diospyros sylvatica* (43.18) and *Cleistanthus collinus* (14.77) found to have higher relative density value. Three species namely *Emblica officianalis*, *Osyris peltata* and Xymenia Americana (Billa) are having lesser value. Diospyros sylvatica (Gatha) (23.12) and Pterocarpus marsupium (Yegisa) (15.75) found to be having more relative dominance value. Diospyros sylvatica (Gatha) (77.42) and Wrightia tinctoria (Ankudu) (35.61) found to have high IVI value. Shannon's index of diversity (H) is all most equal in all the areas and Mallavaram RF showed high Simpson's index of species dominance (C) value and Gedhada and Pothavaram RF areas recorded high Menhinick's index of Species richness (R). Above all height and girth of all the species also recorded. Annual increment data also recorded and both in treatment and control plot and found that JFM works found to be effective in improving the growth and regeneration of the forests. Our study of TP-1 areas helped to identify endemic and endangered species in the miscellaneous forests. Based on this, measures can be taken up to protect the biodiversity.

Key words: JFM, TP-1, Biodiversity.

INTRODUCTION

The protective, productive and accessory functions are the major uses of forests. Forests also provide habitats for higher wild life species diversity than any other biome. They buffer us against noise, absorb air pollutants and nourish the human spirit. Over the years the forests have been destroyed and have been replaced by settlements, urban and rural, industries, farm and grazing lands and many other uses. Reduction in cover is adversely affecting the global climate and rainfall patterns. In view of this, afforestration of degraded forests is essential to maintain ecological equilibrium.

Participatory action involving the government and local communities for regeneration of degraded forests through effective protection, sharing of produce and improving the socio economic conditions of the forests communities was initiated by the Forest Department as a pilot project in Arabari, West Bengal in 1971-72. Subsequently, this has been institutionalized through the forest policy of 1988 and JFM (Joint Forest Management) circular of June 1990. JFM basically introduced to focus on people rather than trees and established mechanisms through which local communities take part in decision making process and implementation of forest management work (Krahl and Henderson, 1998). The launching of this programme has been a major breakthrough in the involvement of local communities in the management of forests and has produced positive results in regenerating the degraded forests.

Consequent to a resolution issued by the Government of India, Ministry of Environment and Forests, on June 1, 1990, the Andhra Pradesh State Government has adopted the JFM programme in 1993, as one of the three major components of the World Bank supported "Andhra Pradesh Forestry Project" (APFP). The JFM component under the APFP envisages developing 173 thousand hectares of degraded forests through Village Forest Societies, specially formed for the purpose. This programme from 1994 to 2000 A.D. covered 11 % of the total forest area that needed rehabilitation. In 1996, this programme has been extended to the remaining parts of the degraded forests, through a special campaign called "Vana Samrakshana Udyamam (VASU)" (Kameswara Rao, 1998).

A need has arisen to evaluate the impact of the about new management tool in the degraded forests. Different workers studied the impact of such management systems on conservation of forests biodiversity. Kameswara Rao (1998) studied the impact of JFM activities on the vegetation and development of Eastern Ghats region of A.P, Varma et al., (2005) in the plantation forest and degraded forest of Surajpur block (Barotiwala) of Kuthar Forest Range in Kunihar Forest Division of Himachal Pradesh, Sahoo et al., (2004) in Abhoya of Midnapore District of West Bengal (India), Ranjana Gupta (2004) in Dodsi and Talaichittor villages of Dahra Dun District and Chandrashekara and Jayaraman (2002) in natural forests of Kerala, Pratima *et al*. (2002) studied JFM at village level, Ajaz Ahmed (2002) studied object oriented forest management system. All these studies indicated positive effect of JFM and other such management works in improving the forest cover as well as increasing the income of the forest communities.

JFM works were taken up in Srikakulam and Vizainagaram districts of Andhra Pradesh also for the regeneration of forests. In the present investigation, an attempt has been made to study the impact of JFM works on these forests. Impact of treatment practice-I works were studied in the Burna, Baliagam and Shikargangii Reserve Forests of Srikakulam and Vizainagaram districts of Andhra Pradesh.

MATERIALS AND METHODS

The present investigation carried out by laying sample plots at different areas where Treatment practices are carried out for the improvement of degraded forests under APFP (Andhra Pradesh Forestry Project). The details of the sample plots and methodology adopted are given below.

Burna RF: In Srikakulam district miscellaneous forest of Burna RF located at Burna North Beat, Veeragattam section, Palakonda Range and Srikakulam division was selected. The area is Northern tropical dry mixed deciduous forest type and semi-evergreen sub-forest type. The one hectare area trial plot is laid in the compartment number 211 and the name of the VSS is Polla. Compartment number 211 can be referenced with the Survey of India Topo Sheet number 65 N/9. The elevation of the area is 300 m high. Soil type is red soil, soil texture is sandy loam and topsoil erosion is medium.

Baliagam RF: In Srikakulam district, miscellaneous forest of Baliagam RF located at Bogabanda Beat, Mandasa Section, Kasibugga Range and Srikakulam division was selected. The type of forest is dry deciduous forest and IIIrd quality type with 300 m elevation and North south aspect. Soil type is red soil, soil texture is sandy loam and top soil erosion is medium. Rock type is Granite. The name of the VSS is Sandur. The one hectare area trial plot laid in the compartment number of the area is 218.

Shikargangii RF: In Viziayanagaram district, miscellaneous forest of Shikargangii RF located at Shikargangii Beat, Bobbili Section, Parvathipuram Range and Vizainagaram division was selected. The type of forest is dry deciduous forest. The name of the VSS is Brahmanavalasa. The sample plot is located at side of the mountain and the area is plain. The soil in this area is red soil with large boulders. The compass reading of this area is 34*.40' N - E. The area is badly affected by the biotic pressure and now it is improved by the JFM works. Beside the sampling plot, Multilocational Trail plots were laid by the Forest Research Department to improve the quality of the plants. The one hectare area trial plot laid in the compartment number of the area is 336. The area is low rain fall region. Due to technical problems, GPS reading was not taken.

Methodology

To study the impact of TP-1, sample plots were laid out in selected reserve forests areas where TP-1 operations are being carried out. One of the method followed in laying sample plots was the stratified random sampling. In stratified random sampling the forest will be divided in to a number of zones or strata that are as homogeneous as possible. Within these strata, plots are located at random. To determine yield capacity and growth in forest areas successive re-measurements on well stocked sample plots after a lapse of fixed intervals will be taken up. The way to find growth can be based on sample plot method. Permanent sample plots (PSPs) are permanently demarcated areas of forest, typically of one hectare, which are periodically remeasured. They provide an estimate of changes in forest stocking and volume. This information is essential for the rational management of the forest. In the present study, all the three locations of TP-1 areas, sample plots of one hectare area were permanently demarcated with stones. This one hectare plot was initially divided in to four quadrants and again in each quadrant one 10 m x 10 m. sub plot and in the center of the four quadrants another 10 m x 10 m. sub plot were laid with permanent demarcation.

Data on the name and number of the species and their basal girth (cm), girth at breast height (cm) and height (m) of the trees etc. was taken from each sub plot in the TP-1 areas. From the recorded data all the species are classified according to girth-height class wise. The species composition, Density, Abundance and Frequency of various species and regeneration of the species present in the plot were calculated. Menhinicks index of species richness, Shannon-Wiener index of species diversity and Simpson's index of dominance of the community were also calculated (Chandrashekera et al. 2002). The periodical measurements and analysis of growth data in treated and control plots were calculated to study the impact of JFM works ie TP-1 operations.

RESULTS

Burna RF: Among 24 tree species recorded at Burna RF, *Terminalia tomentosa* is uniformly distributed over entire area (100% frequency) followed by *Bridella retusa* (80%), *Casearia elliptica* (80%) (Table 2). Though concentrated in some particular area only, *Wrightia tinctoria* (4.8) recorded higher density value, higher abundance (8) value and higher relative density (20.8*). Bridella retusa* (1.00) recorded higher relative abundance value followed by *Pterocarpus morsupium* (0.82).

Table-2: ***Species composition, Relative Density, Relative Frequency, Relative Dominance and Importance Value Index (IVI) at Burna RF***

S. No	Name of the Species	Frequency	Frequency class *1	Density	Abundance	R.D*2	RFq*2	R.Dom*2	IVI*2
1	*Mallatus. phillippensis*	40	B	0.4	1.00	1.7	4.1	0.03	5.83
2	*Bridella retusa*	**80**	D	3.4	4.25	14.7	8.3	1.00	**24**
3	*Diospyros melanoxylon.*	60	C	0.6	1.00	2.6	6.2	0.02	8.8
4	*Croton lacciferus-- Siri*	40	D	1.2	3.00	5.2	4.1	0.15	9.45
5	*Terminalia tomentosa*	**100**	**E**	3.0	3.00	13.0	10.4	0.73	**23.7**
6	*Pterocarpus morsupium*	40	B	1.0	2.50	4.3	4.1	0.82	9.2
7	*Bombax ceiba*	20	A	1.0	1.00	0.8	2.0	0.1	2.9
8	*Cleistanthus collinus*	40	B	1.0	2.50	4.3	4.1	0.09	8.49
9	*Dalbergia latifolia*	20	A	1.0	1.00	0.8	2.0	0.12	2.92
10	*Bauhinia racemosa*	20	A	1.0	1.00	0.8	2.0	0.03	2.83
11	*Wrightia tinctoria*	60	C	4.8	8.00	20.8	6.2	0.16	**27.1**
12	*Casearia elliptica*	80	D	1.0	1.25	4.3	8.3	0.07	**12.6**
13	*Atylosia limeata*	40	B	0.4	1.00	1.7	4.1	0.40	6.2
14	*Terminalia bellirica*	20	A	1.0	1.00	0.8	2.0	0.10	2.9
15	*Garuga pinnata*	60	C	0.6	1.00	2.6	6.2	0.15	8.95
16	*Diospyros sylvatica*	40	B	1.8	4.50	7.8	4.1	0.09	**11.9**
17	*Careya arborea*	20	A	1.0	1.00	0.8	2.0	0.0	2.8
18	*Botanical name not found*	20	A	1.0	1.00	0.8	2.0	0.0	2.8
19	*Emblica officianalis*	20	A	0.4	2.00	1.7	2.0	0.0	3.7
20	*Antidesma acidum*	40	B	0.6	1.50	2.6	4.1	0.0	6.7
21	*Dalbergia paniculata*	20	A	1.0	1.00	0.8	2.0	0.07	2.87
22	*Ficus hispida*	20	A	0.6	3.00	2.6	2.0	0.06	4.66
23	*Albizia stupulata*	40	B	0.4	1.00	1.7	4.1	0.02	5.82
24	*Syzygiumcumini*	20	A	0.4	2.00	1.7	2.0	0.05	3.75

Wrightia tinctoria (27.16) belongs to the family *Apocynaceae*, recorded highest IVI value followed by *Bridella retusa* (24.0) belongs to the family *Euphorbiaceae* and *Terminalia tomentosa* (23.7) belongs to the family *Combretaceae*. *Dalbergia paniculata* (2.8) belongs to the family *Fabaceae* recorded lowest IVI value. *Bridella retusa*, *Wrightia tinctoria* and *Terminalia tomentosa* are the species distributed over entire area and dominant among all the other species.

Dalbergia latifolia, *Dalbergia paniculata* and *Terminalia bellirica* are the species found in only one quadrate out of five quadrates laid in one hectare and only one tree was observed, this shows that these species are going to be endangered and conservation of these species is necessary.

In this location the Shannon's index value of diversity is 3.896. The simpson's index value of species dominance is 0.101 and the Menhinick's index value of species richness is 2.238 (Table 11).

Table 11: ***Information on Vegetation with respect to tree community at different RF areas studied***

S.No	Location details	Total number of Individual species	H*	C*	R*
1	Burna RF	**24**	**3.896**	0.101	**2.238**
2	Baliagam RF	11	2.01	0.226	1.146
3	Shikargangii RF	14	2.69	**0.229**	1.347

Note: H* = Shannon's index of diversity, R*= Menhinick's index of Species richness and C*=Simpson's index of species dominance

Terminalia tomentosa and *Pterocarpus morsupium* are found in highest height class (>10 m). *Terminalia tomentosa* is found in almost all the highest classes except above 14 m. More number of trees found in 2-4 m height class (39), followed by 4-6 m height class (27) and 6-8 m height class (25). Only one tree was found in 14-16 m height class. (Table 3,8). More number of trees found in 10-30 cm girth class (85), followed by 30-50 cm girth class (24). No trees were found in the girth class of 90-110 cm (Table 3,9).

Baliagam RF: A total of 11 different tree species were observed (Table 4). 8 species occupied entire area and only three species i.e. *Emblica officianalis*, *Osyris peltata* and *Xymenia Americana* found only in one quadrate with single digit number. *Diospyros sylvatica* (12.66) and *Cleistanthus collinus* (4.33) found to be having more density and abundance value. *Diospyros sylvatica* (43.18) and *Cleistanthus collinus* (14.77) found to have higher relative density value. Three species namely *Emblica officianalis*, *Osyris peltata* and Xymenia Americana (Billa) are having lesser value. Diospyros sylvatica (Gatha) (23.12) and Pterocarpus marsupium (Yegisa) (15.75) found to be having more relative dominance value. Diospyros sylvatica (Gatha) (77.42) and Wrightia tinctoria (Ankudu) (35.61) found to have high IVI value.

Table 4. ***Species composition, Relative Density, Relative Frequency, Relative Dominance and Importance Value Index (I.V.I) at Baliagam RF***

S. No	Name of the Species	Vernacular name	Frequency	Frequency class*1	Density	Abundance	R.D*2	RFq*2	R.Dom*2	IVI*2
1	*Azardirachta indica*	*Vepa*	100	E	1.33	1.33	4.54	11.1	9.18	24.84
2	*Cleistanthus collinus*	*Odassi*	100	E	**4.33**	**4.33**	**14.77**	11.1	8.53	34.42
3	*Wrightia tinctoria*	*Ankudu*	100	E	**4**	**4**	13.63	11.1	10.86	**35.61**
4	*Diospyros sylvatica*	*Gatha*	100	E	**12.66**	**12.66**	**43.18**	11.1	**23.12**	**77.42**
5	*Bignonia suberosa*	*Karaka*	100	E	1.33	1.33	4.54	11.1	3.12	18.78
6	*Pterocarpus marsupium*	*Yegisa*	100	E	1.33	1.33	4.54	11.1	15.75	31.41
7	*Diospyros melonoxylon*	*Tuniki*	100	E	1	1	3.4	11.1	10.67	25.19
8	*Emblica officianalis*	*Amla*	33	B	0.33	1	1.13	3.67	0.51	5.31
9	*Osyris peltata*	*Konda tamara*	33	B	0.33	1	1.13	3.67	0.29	5.09
10	*Xymenia americana*	*Bill*	33	B	0.66	2	2.27	3.67	**15.38**	21.32
11	*Persea macrnatha*	*Nara*	100	E	3.33	3.3	11.36	11.1	6.24	28.72

*1 A = 0-20 Frequency %, B =21-40%, C =41-60%, D =61-80%, E =81-100 %

*2 (R.D) Relative density; (RF) Relative Frequency; (R.Dom) Relative Dominance

IVI=Important Value Index.

Out of ten plots, Persea macrnatha (Nara), Bignonia suberosa (Karaka) and Osyris peltata (Konda tamara) found only in this plot and these are not present in any other area. Their number is also very less, so it is necessary to conserve these species. Economical plant species Diospyros melonoxylon (Tuniki or Beedi leave) is found in this area.

In this location the Shannon's index value of diversity is 2.01. The simpson's index value of species dominance is 0.226 and the Menhinick's index value of species richness is 1.146.

Shikargangii RF: The type of the forest is dry deciduous forest. The sample plot is located at side of the mountain and the area is plain area. The soil in this area is red soil with large boulders. 14 different species observed (Table 20) and out of these, six species occupied entire area uniformly and three species present in two quadrates and five species present only in one quadrate with single digit number. Diospyros sylvatica (Gatha) (100) found to be uniformly distributed over entire area and 46 individual plants are present in this plot.

Diospyros sylvatica (Gatha) (15.33; 15.33; 42.59; 4.75) and Cleistanthus collinus (Odassi) (4.66; 4.66; 2.96; 1.44) found to be having high density, abundance, Relative density and Relative frequency values respectively. Diospyros sylvatica (Gatha) (40.63) and Buchanania latifolia (Jarumaru) (14.25) found to be having high Relative dominance value. Diospyros sylvatica (Gatha) (87.97), Cleistanthus collinus (Odassi) (27.37) and Bixa orellana (Jafra) (25.81) found to be having high IVI value.

Out of the ten plots laid the species Arum esculentum (Chema), Balsamodendron caudatum (Kondragi), Buchanania latifolia (Jarumaru), Sapindus trifoliatus (Ritta Kaya), Pongamia pinnata (Kanuga) and Zizyphus jujube (Konda regu) were found only in one this plot and these are not found in any other plots further the number of these plants are very less and hence conservation of the species is necessary.

In this location the Shannon's index value of diversity is 2.69. The simpson's index value of species dominance is 0.229 and the Menhinick's index value of species richness is 1.347.

DISCUSSIONS AND CONCLUSION

Kushwah (2002), Sudha *et al*. (1998), Munesh Kumar (2004), Chandrashedara *et al*. (2002), Pande *et al*. (1996,2002), Prem Kumar *et al*. (2003), Sahoo *et al.* (2004), Kameswara Rao (1998), Verma *et al.* (2005) and Chandrashekara and Jayaraman (2002) etc researchers conducted study on biodiversity. In our study we have selected 4 different areas. Each and every area is differing from each other both climatically and topographically. The soil characteristics are also differing from each other. The topography of the locations includes mountainous and plain areas.

The type of forests includes dry deciduous forest, moist mixed forest and moist mixed forest types. We recorded the flora of these locations. Present study helped to understand the plant biodiversity growth variation of different forest species in the East Godavari district of Andhra Pradesh. Forest growth difference between the managed forests and non managed forest areas were also estimated. Our study also provided the information of the economically useful plant species present in different areas, such information is useful to the local communities and government in planning generation activities.

Our study also provided information on the endemic and endangered species and social conditions of different areas and why the deforestation is more in some areas and very less in some areas. According to our study, deforestation can be stopped, if continuous work is provided to the local communities for their survival. Based on this measures can be taken up to protect the biodiversity. This study also helped to know the effectiveness of in improving the growth and regeneration of the forests. Encouragement of JFM works not only improving the degraded forests but also reducing the biotic pressure in the forest areas. JFM works (TP-1) found to be effective in improving the growth and regeneration of the forests.

Table - 1*: Geo-Position Details of Study areas*

S.No	Reserve Forest	Section	Range	Division	District	Type of the Forest and area	Geopositing system readings or Compartment number (C.No)
				TREATMENT PRACTICE NO- ONE (TP-1)			
1	Burna	Veeragattam	Palakonda	Srikakulam	Srikakulam	Northern tropical dry mixed deciduous forest and mountaneous area	24*.30' N - E (Compass reading) C.No : 211
2	Baliagam	Mandasa	Kasibugga	Srikakulam	Srikakulam	Dry deciduous forest and mountaneous area	C.No : 218
3	Shikargangii	Bobbili	Parvathipuram	Vizainagaram	Vizainagaram	Dry deciduous forest and Plain area	34*.40' N - E (Compass reading) C.No : 336

Table –3: ***Summary of height wise and girth wise distribution of different species at Burna RF***

Girth classification (cm)	Height classification (m)								
	0-2	2-4	4-6	6-8	8-10	10-12	12-14	14-16	Total
10-30	**7**	**39**	**23**	**13**	**1**	**1**	**1**	**0**	85
30-50	**0**	**0**	**3**	**10**	**8**	**3**	**2**	**0**	26
50-70	**0**	**0**	**1**	**1**	**0**	**0**	**1**	**0**	3

70-90	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	2
90-110	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
Total	**7**	**39**	**27**	**25**	**9**	**4**	**4**	**1**	**116**

Table –5 ***Summary of height wise and girth wise distribution of different species at Baliagam RF***

Girth classification (cm)	Height classification (m)								
	0-2	2-4	4-6	6-8	8-10	10-12	12-14	14-16	Total
1-10	**49**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	49
10-30	**39**	**7**	**0**	**0**	**0**	**0**	**0**	**0**	46
30-50	**0**	**6**	**0**	**0**	**0**	**0**	**0**	**0**	6
50-70	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
70-90	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
90-110	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Total	**88**	**13**	**0**	**0**	**0**	**0**	**0**	**0**	101

Table – 6 ***Species composition, Relative Density, Relative Frequency, Relative Dominance and Importance Value Index (I.V.I) at Shikargangii RF***

S.No	Name of the Species	Frequency	Frequency class *1	Density	Abundance	R.D*2	RFq*2	R.Dom*2	IVI*2
1	*Diospyrios sylvatica*	100	15.33	**15.33**	**15.33**	**42.59**	**4.75**	**40.63**	87.97
2	*Arum esculentum*	**33.33**	**0.33**	0.33	1	0.92	0.1	0.42	**1.44**
3	*Bixa orellana*	100	3.33	3.33	3.33	9.25	1.03	**15.53**	25.81
4	*Balsamodendron caudatum*	100	3.33	3.33	3.33	9.25	1.03	7.44	17.72
5	*Diospyrios ferrea*	**100**	**3.66**	3.66	3.66	10.18	1.13	4.7	**16.01**
6	*Cleistanthus collinus*	100	4.66	4.66	4.66	**12.96**	1.44	12.97	27.37
7	*Buchanania latifolia*	66.66	0.66	0.66	1	1.85	0.2	14.25	16.3
8	*Aerva javanica*	33.33	0.33	0.33	1	0.92	0.1	0.42	1.44
9	*Ochna obtusa*	100	1.66	1.66	1.66	4.62	0.51	4.25	9.38
10	*Pongamia pinnata*	66.66	0.66	0.66	1	1.85	0.2	0.63	2.68
11	*Zizyphus jujuba*	66.66	0.66	0.66	1	1.85	0.2	2.34	**4.39**
12	*Wrightia tinctoria*	33.33	0.66	0.66	2	1.85	0.2	3.19	**5.24**
13	*Lannea caromandelica*	33.33	0.33	0.33	1	0.92	0.1	1.91	2.93
14	*Sapindus trifoliatus*	33.33	0.33	0.33	1	0.92	0.1	1.91	**2.93**

****1 A = 0-20 Frequency %, B =21-40%, C =41-60%, D =61-80%, E =81-100 %***

****2 (R.D) Relative density; (RF) Relative Frequency; (R.Dom) Relative Dominance***

IVI=Important Value Index.

Table –7: ***Summary of height wise and girth wise distribution of different species at Shikargangii RF***

Girth classification (cm)	Height classification (m)								
	0-2	2-4	4-6	6-8	8-10	10-12	12-14	14-16	Total
1-10	**100**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	101
10-30	**5**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	7
30-50	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
50-70	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
70-90	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
90-110	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Total	**105**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	108

Table 8. ***Height wise distribution of various species at different RF areas studied***

		**Height classification (m) ----------> **									
S.no	**Name of the RF**	**0-2 m**	**2-4 m**	**4-6 m**	**6-8 m**	**8-10m**	**10-12 m**	**12-14 m**	**14-16 m**	**16-18 m**	**Total**
1	**Burna RF**	7	39	27	25	9	7	0	0	0	**114**
2	**Baliagam R**	76	13	0	0	0	0	0	0	0	**89**
3	**Shikargangii RF**	106	2	0	0	0	0	0	0	0	**108**
	Total	**189**	**54**	**27**	**25**	**9**	**7**	**0**	**0**	**0**	**311**

Table 9. ***The Girth wise distribution of various species at different RF areas studied***

Girth classification	**Burna RF**	**Baliagam RF**	**Shikargangii RF,**	**Total**
1-10 cm	**0**	39	101	**140**
10-30 cm	85	44	7	**136**
30-50 cm	24	6	0	**30**
50-70 cm	4	0	0	**4**
70-90 cm	1	0	0	**1**
90-110cm	0	0	0	**0**
Total	**114**	**89**	**108**	**311**

Table 10. ***Soil analysis report of different Reserve Forest areas studied.***

S.No	Reserve Forest	p^H	Total Nitrogen (kg/ha)	Available Phosphorus (kg/ha)	Available Potassium (kg/ha)	Available zinc (ppm)	Available Manganese (Mn) (ppm)	Available Iron (ppm)	Available Copper (ppm)
1	Burana	7	315	10	385	0.9	30.1	12.2	0.822
2	Baliagam	6.5	290	13	256	0.26	27.76	6.69	0.473
3	Shikargangii	6.5	128	15	230	0.33	29.93	10.87	0.276

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