IDENTIFICATION OF FORESTLAND AS ENVISAGED IN THE FOREST CONSERVATION ACT

N.C. BAHUGUNA*

Introduction

The Forest (Conservation) Act, 1980 or FCA is silent on the definition of the word 'forest'. Initially, the application of this Act was restricted to the areas in possession of the Forest Department. On 12.12.1996 in the matter of 202/95, the Apex Court in a landmark judgment clarified that :

> *"The Forest Conservation Act, 1980 was enacted with a view to check further deforestation which ultimately results in ecological imbalance; and therefore, the provisions made therein for the conservation of forests and for matters connected therewith, must apply to all forests irrespective of the nature of ownership or classification thereof. The word "forest" must be understood according to its dictionary meaning. This description covers all statutorily recognised forests, whether designated as reserved, protected or otherwise for the purpose of Section 2(i) of the Forest Conservation Act. The term "forest land", occurring in Section 2, will not only include "forest" as understood in the dictionary sense, but also any area recorded as forest in the Government record irrespective of the ownership. This is how it has to be understood for the purpose of Section 2 of the Act. The provisions enacted in the Forest Conservation Act, 1980 for the conservation of forests and the matters connected therewith must apply clearly to all forests so understood irrespective of the ownership or classification thereof."*

To gear up the process, the Hon'ble Court even ordered that : *"each State Government should constitute within one month an Expert Committee to* :

1. *Identify areas which are "forests" irrespective of whether they are so notified, recognized or classified under any law, and irrespective of ownership of the land of such forest;*
2. *identify areas which were earlier forests but stand degraded, denuded or cleared; and*
3. *identify areas covered by plantation trees belonging to the Government and those belonging to private persons."*

Thereafter, some of the states hurriedly identified forestlands to complete the formalities. Consequently, anomalies cropped in but no attempts were made to correct these mistakes. A few other states did not make efforts at all. The remaining states initiated the process and tried to define the 'forest' but did not complete the process.

The main difficulty in identifying a 'forest' as clarified by the Apex Court, was what should be the minimum area and minimum vegetation density for considering a piece of land as a 'forest'.

* Regional CCF (Central Zone), MoEF, GoI, Kendranchal, Aliganj, Lucknow (U.P.)

Different states used different parameters and the definition became subjective. In the meantime, a few individual attempts were made. Gupta *et al.* (2001) defined 'forest' as :

> *"A substantial area of land having a complex array of plant species especially arborescent taxa in dominance along with shrubs, herbaceous plants, lichens, ferns, mosses, fungi, bacteria, protozoa, etc. providing an abode to distinctive forms of animal life such as worms, insects and wildlife and mutually related to the factors of locality of that region."*

An attempt was also made by Bahuguna (2004) to define a 'forest' on the basis of ecological considerations. These attempts failed to yield any result due to discretionary nature of explanation.

Methodology

Criteria for identifying a forest

The main reason for enactment of FCA was the present trend of depleting forests and degeneration of ecosystem which is essential for survival of man. As already quoted, the Apex Court in the said order has stressed the significance of forest for ecological imbalance. Therefore, ecology should also be a consideration for defining a forest. Even various dictionaries have included wilderness areas or game preserves within the meaning of forest without any mention of arborescent taxa. Thus, in the dictionary sense, the meaning of 'forest' as mentioned in FCA, can not be confined to a tree tract only.

An area frequented by man is generally not important from wildlife point of view, even if there are large numbers of trees. An orchard with dense crop, for example, is not a forest. This is because the interference of man makes it unsuitable for wildlife. The only wildlife surviving there are the species which are humanised and are dependent on man for their survival. On the other hand, the desert areas of Rajasthan, which even without any tree growth, are the prime habitat of Great Indian bustard. Similarly, vast water bodies inside Sundarbans and beyond inhabit various mammals, fish and other aquatic fauna. River dolphins are found in Gangetic, Indus and Brahmaputra river systems. Treeless mountain deserts give shelter to various ungulates and other high altitude fauna. Although not forests in true sense, foresters or forest biologists would like to apply the expanded scope of the dictionary meaning of forests for protection of these important areas to fulfil the basic objectives of FCA.

In this connection, it is to be emphasized that the wildlife, whether in common parlance or among scientific community, is the inherent component of forest since the origin of the word 'forest'. *Consequently, any area where wildlife naturally enjoys more right than a man has to be a 'forest'.* In the Wildlife (Protection) Act, 1972, wildlife has been defined to include any animal, aquatic or land vegetation which forms part of any habitat. This definition of wildlife shows that ecological consideration is essential component of a 'forest'. As mentioned above, the author made an attempt on these lines only (Bahuguna, 2004). No one contradicted or criticised this view. Rather a few appreciated it.

Extent of area and vegetation density

The emphasis on wildlife and ecology, however, further complicates the identification of forest as each and every inch of land on earth and every corner in the universe has ecological importance. Moreover, there is a lack of clarity and absence of well-defined boundaries. Still to streamline the process of identification of forest certain criteria could be made a basis.

A biologist would agree that large tract of even a barren wasteland inhabits a variety of flora and fauna which survives there just because there is little human impact on such land. Therefore, along with the density of vegetation, the quantum of area becomes an important factor in defining a 'forest'.

Any area where human interference is little, wildlife takes over. From this, it can be inferred that a dense patch of natural vegetation even in a small area is forest. At the same time, a large chunk of wasteland is a wilderness area irrespective of the density of vegetation. Technically not possible, yet it is essential to quantify a 'minimum area' or 'minimum density' to make such criteria practicable. Considering the density as the main criterion, less than one hectare area in general is not a 'forest'. On the other hand, a large tract of land (say more than 100 ha) even without a tree on it should be a 'forest'.

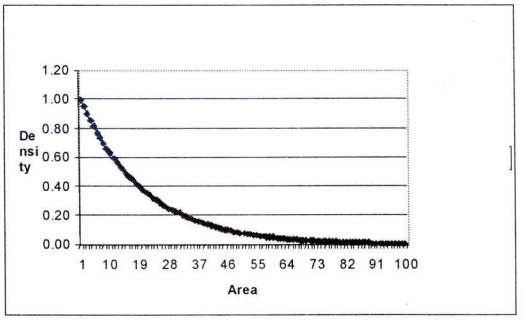
The Minimum Required Density (MRD) for identifying a forestland between one hectare with density one and one hundred hectares with density zero can be found out from a formula on the basis of 5% reduction calibrated exponentially for increase of each hectare of land area.[1]

$MRD = (1-5/100)^{A-1} = (0.95)^{A}$
where A is the area in hectares

For example, for an area of 3.763ha, MRD would be $(0.95)^{3.763-1} = (0.95)^{2.763-1} = 0.87$.

Thus an area of 3.763ha should be considered a forestland if the density of the area is more than 0.87. Such forestlands could be identified more easily through graphical representation shown in Fig. 1.

Fig. 1



Forestland by density

For further convenience, the decimal figures could be discarded by rounding up the area into complete number as shown in Table 1.

The density of forest many times becomes confusing especially in a patch where top canopy is poor but middle storey or undergrowth is well stocked or *vice versa*. In such situation, number of trees is

[1] All the parameters, figures and formulae in this article are hypothetical. Instead of any scientific basis, these factors have been chosen on the basis of personal field experience keeping them user friendly as far as possible. Any modification or arbitrary change may make these calculations complicated or impractical. The reduction could be simplified but exponential reduction is realistic approach.

Table 1

Forestland by density (figures rounded off)

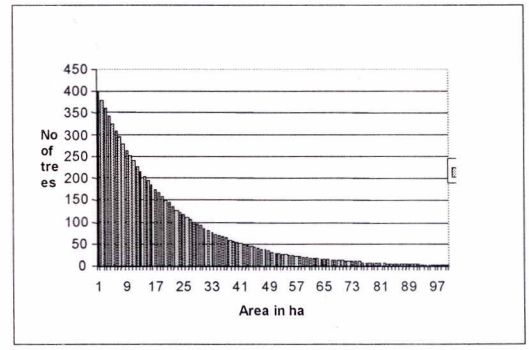
Area (ha)	Density	No. of trees	Area (ha)	Density	No. of trees	Area (ha)	Density	No. of trees	Area (ha)	Density	No. of trees	Area (ha)	Density	No. of trees
1	1.00	400	21	0.36	143	41	0.13	51	61	0.05	18	81	0.02	7
2	0.95	380	22	0.34	136	42	0.12	49	62	0.04	18	82	0.02	6
3	0.90	361	23	0.32	129	43	0.12	46	63	0.04	17	83	0.01	6
4	0.86	343	24	0.31	123	44	0.11	44	64	0.04	16	84	0.01	6
5	0.81	326	25	0.29	117	45	0.10	42	65	0.04	15	85	0.01	5
6	0.77	310	26	0.28	111	46	0.10	40	66	0.04	14	86	0.01	5
7	0.74	294	27	0.26	105	47	0.09	38	67	0.03	14	87	0.01	5
8	0.70	279	28	0.25	100	48	0.09	36	68	0.03	13	88	0.01	5
9	0.66	265	29	0.24	95	49	0.09	34	69	0.03	12	89	0.01	4
10	0.63	252	30	0.23	90	50	0.08	32	70	0.03	12	90	0.01	4
11	0.60	239	31	0.21	86	51	0.08	31	71	0.03	11	91	0.01	4
12	0.57	228	32	0.20	82	52	0.07	29	72	0.03	10	92	0.01	4
13	0.54	216	33	0.19	77	53	0.07	28	73	0.02	10	93	0.01	4
14	0.51	205	34	0.18	74	54	0.07	26	74	0.02	9	94	0.01	3
15	0.49	195	35	0.17	70	55	0.06	25	75	0.02	9	95	0.01	3
16	0.46	185	36	0.17	66	56	0.06	24	76	0.02	9	96	0.01	3
17	0.44	176	37	0.16	63	57	0.06	23	77	0.02	8	97	0.01	3
18	0.42	167	38	0.15	60	58	0.05	21	78	0.02	8	98	0.01	3
19	0.40	159	39	0.14	57	59	0.05	20	79	0.02	7	99	0.01	3
20	0.38	151	40	0.14	54	60	0.05	19	80	0.02	7	100	0.01	2

better criterion. The formula for Minimum Required Trees (MRT) in that case would be :

$MRT = 400\ (1\text{-}5/100)^{A\text{-}1} = 400\ (0.95)^{A\text{-}1}$
where A is the area in hectares.

For a patch of 8.6723ha, MRT is $400 \times (0.95)^{86723\text{-}1} = 400 \times (0.95)^{7.6723} = 270$. Thus 8.6723 ha land will be a forestland if there are more than 270 trees on it. The relation between the area and number of trees is shown in Fig. 2 for ready reference. As in case of density this formula could also be

Fig. 2



Forestland by trees

simplified by rounding up the area into complete number as shown in Table 1.

This formula is based on the assumption that in a big chunk of well stocked forest there are rarely more than 400 trees per hectare. For this, only the trees above 10cm diameter at breast height should be counted. In case of coppice growth or boles originating from same stump within one foot above ground level, only one tree should be counted.

In spite of these calculations even after simplifications, confusion is likely to occur in the field. For this, both the factors, i.e., the density and the number of trees should be taken into account. In case of variation, the land should be treated a forestland even if one of these criteria is fulfilled.

A small patch of land is generally not a forest. Still the above criteria may cause confusion. For example an area of 1.01ha with 400 trees on it shall be a forest but an area of 0.99ha with 450 trees on it shall not be forest. Therefore, very dense areas less than one hectare should also be brought in the category of forest. Moreover, prime habitat of some endangered wildlife or an area consisting of some rare flora should be treated a forestland. The significance of this area becomes important since dense patches of vegetation, often contain rare and endangered flora and fauna. Non-forest use of such patch could be dangerous to the survival of this flora and fauna. The density could lead to confusion in a small patch. Therefore, the number of trees per hectare should be the convenient method to identify all such areas. To remove these anomalies a formula for MRT could be derived on 2% exponential increase in the number of trees for reduction of every 0.01 ha of land area. The formula would be :

$$MRT = 400 \times (1+2/100)^{100\,(1-A)}$$
$$= 400 \times (1.02)^{100\,(1-A)}$$

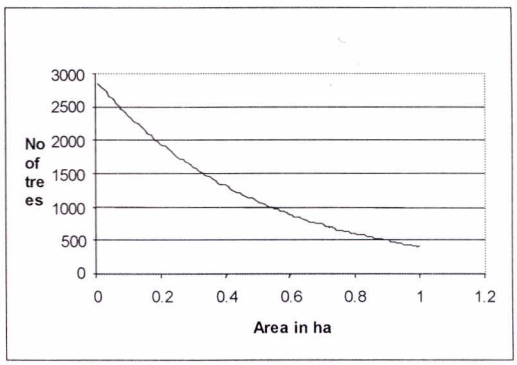
where A is the area in hectares

This relation between the area and number of trees is shown in Fig. 3 and by rounding up to decimal figures in Table 2 for ready reference. A sharp increase in the number of trees for a very small area looks impractical and not likely to occur in the field. Yet it must be remembered that too small a patch shall not be a forest howsoever dense it may be. In spite of this, the formula has been retained to remove discretion and doubt among field foresters. In addition, if a small patch of land is very important from ecological angle for survival of some known rare and endangered fauna, it should also be included within the meaning of forest, even if the calculation shows otherwise.

Administrative decisions

A question arises about the area shown as 'forest' in the government records but diverted by the State

Fig. 3



Relation between area and number of trees

Table 2

Relationship between area and number of trees

Area (ha)	No. of trees	Area (ha)	No. of trees	Area (ha)	No. of trees	Area (ha)	No. of trees	Area (ha)	No. of trees	Area (ha)	No. of trees	Area (ha)	No. of trees
1.00	400	0.85	538	0.70	725	0.55	975	0.40	1312	0.25	1766	0.10	2377
0.99	408	0.84	549	0.69	739	0.54	995	0.39	1339	0.24	1802	0.09	2425
0.98	416	0.83	560	0.68	754	0.53	1015	0.38	1365	0.23	1838	0.08	2473
0.97	424	0.82	571	0.67	769	0.52	1035	0.37	1393	0.22	1874	0.07	2523
0.96	433	0.81	583	0.66	784	0.51	1056	0.36	1421	0.21	1912	0.06	2573
0.95	442	0.80	594	0.65	800	0.50	1077	0.35	1449	0.20	1950	0.05	2625
0.94	450	0.79	606	0.64	816	0.49	1098	0.34	1478	0.19	1989	0.04	2677
0.93	459	0.78	618	0.63	832	0.48	1120	0.33	1508	0.18	2029	0.03	2731
0.92	469	0.77	631	0.62	849	0.47	1143	0.32	1538	0.17	2070	0.02	2785
0.91	478	0.76	643	0.61	866	0.46	1165	0.31	1568	0.16	2111	0.01	2841
0.90	488	0.75	656	0.60	883	0.45	1189	0.30	1600	0.15	2153		
0.89	497	0.74	669	0.59	901	0.44	1212	0.29	1632	0.14	2196		
0.88	507	0.73	683	0.58	919	0.43	1237	0.28	1664	0.13	2240		
0.87	517	0.72	696	0.57	937	0.42	1261	0.27	1698	0.12	2285		
0.86	528	0.71	710	0.56	956	0.41	1287	0.26	1732	0.11	2331		

Governments prior to enactment of FCA on 25.10.1980. At that time, the State Governments had full power to use forestland in whatsoever manner they wanted. Any land distributed or allotted by the State Government to whomsoever before such date cease to be a forestland provided that the allotment was specific for non-forestry use and not just the change of ownership. It would be in spite of the fact that such work started after 25.10.1980. However, the land or part of it, which was used or is intended to be used for some other purpose, should be treated as forestland.

In this reference, a distinction should be made between the development and the exploitation activities. An area would be considered as developed if additional environmental safeguards are not needed after completion of works, e.g., construction work. On the other hand an area should be considered as exploited if the area needs to be reclaimed for environmental safeguards after completion of works, e.g., mining work. The area allotted for such mining work but broken up or cleared after 25.10.1980 should (may) be considered a forestland, even if the allotment for mining purpose was made before 25.10.1980.[2]

[2] This logic is not based on the existence of wildlife. Still inclusion of such land in the category of forest is essential from ecological angle for conservation of such land since mining activities are disastrous to the environment and affect large areas even at far off places.

If there are a number of mines operating in a large area, the total area should be taken into account. If the total area already broken up or cleared before 25.10.1980 is more than half of the entire area, the area should be treated as non-forest. Small mining areas less than 1.0ha which are in local use for non-commercial purpose should be excluded from the category of forestland.

Further, the areas, still recorded as 'forest' in the government record updated after 25.10.1980, are forestland in spite of the fact that the lands were diverted before 25.10.1980 and work also completed before 1980. However, in case of Reserved Forest, Protected Forest or other areas notified u/s 20, 28, 29 and 35 respectively of Indian Forest Act, 1927 including state amendments or corresponding provisions of State Forest Acts, a land would cease to become a forestland only if it was de-notified in the official gazette before 25.10.1980 or with the approval of Central Government after this date.

Any area notified as RF u/s 4 of Indian Forest Act, 1927 or corresponding provisions of State Forest Acts, shall be a forestland, when any proceeding under any section from 5 to 20 (both inclusive) and 22 is pending. It would be in spite of the fact that the boundaries are loosely defined and after final notification part of the land is likely to be kept away within the scope of RF. Similarly, any area notified u/s 29 in case of PF and u/s 35 in case of other forests and wastelands would be a forest. The area would cease to become forest if the settlement officer clearly demarcates the non-forest area and his report is accepted by the State and the Central Governments. In case, there is some disagreement, the land under dispute will continue to be a forestland till final decision.

Ecological significance

Any Sanctuary or National Park, being of ecological importance would be a forestland. It would be in spite of the fact that before declaration of Sanctuary or National Park under Wildlife (Protection) Act, 1972, the area comprised non-forest land also. At the same time, any area intended to be declared as Sanctuary or National Park under section 18 or 35 of the Act respectively where any proceeding under any section from 19 to 25 (both inclusive) are pending, would be a forestland. Similarly, an area declared as Conservation Reserve u/s 36A of the Act shall be a forestland. It is to be clarified that Community Reserve declared u/s 36C of the Act, where a community or an individual has volunteered to conserve wildlife and its habitat, is also ecologically important area. The wildlife existing there has more right than man. But this right is dependent on the wishes of the volunteering community or the individual. Therefore, such land would be a forestland only if the volunteering community or the individual so desires because their wishes are the guiding factor for the rights of the wildlife existing there.

Riverbanks are ecologically sensitive long strips of land. Although there is lot of restriction on the collection of sand, bed material and boulders from these lands within recorded forest areas, the collection goes uninterrupted from such lands elsewhere. Such interference on the riverbanks leads to soil erosion causing ecological disturbance at far off places down the stream. These areas due to ecological sensitivity in spite of lack of

direct relationship with wildlife should be treated as forestlands.

Conservation activity

Of late, there is a tendency of the State Governments to create more and more zoos (including zoological parks, zoological gardens, safaris etc.) for entertainment of visitors in the name of conservation. It is because in India u/s 38H of the Wildlife (Protection) Act, 1972, no zoo can be recognised unless Central Zoo Authority pays due regards to conservation of wildlife. Thus conservation aspect is in-built in a zoo. Therefore, a land brought under zoo to fulfil conservation objective would become a forestland.[3]

People's participation

At many places, plantations raised under social forestry schemes might have taken the shape of good forest cover. The objective of these plantations is to encourage local people to increase green cover with intention of optimising the use of fallow lands. As the name suggests, the public has inherent right on these plantations. The right of wildlife is thus confined to the wishes of the owner of the land unless the right of the owner is limited to the protection of such plantation. Bringing these lands into the fold of FCA would discourage people from raising plantation in future. These plantations may include, road/rail side plantations, canal bank plantations, plantations raised on vacant land etc. These are non-forestlands. However, areas, which before such plantation activity would have been included in the definition of forest on the basis of criteria explained above, would continue to be forestlands. Similarly, orchards, tea gardens, herbal gardens, agro-forestry farms, silvo-pastoral areas etc. raised on forestlands prior to 25.10.1980 or raised on non-forestland after this date are non-forestland even if the density of vegetation is very high and canopy cover is very good. An area has been brought into the category of forestland in government records after 25.10.1980 shall, however, be a forestland.[4]

Execution and Conclusion

India is a vast country and field conditions differ from place to place. No universal formula can be made applicable throughout the country. In spite of all this analysis, some confusion is inevitable to arise in the field. To solve this problem, the State Governments should carry out the work of identification of forest- land on assumptions made above to make a list of forest areas. In case there is doubt, a separate list may be made for such areas.

The State Government should form district level committees consisting of at least DM, DFO, public representatives and NGOs. The Committee should submit the report, listing the forestlands (including the areas where doubt occurs about the classification), to their State Government and also get it published in local newspaper for comments from public. The State

[3] It may be noted that non-forestry activities are inherent component of a zoo. Therefore, diversion of forestland for creation of a zoo or diversion of a piece of land within a zoo (created for conservation purpose) for any non-forestry activity would attract FCA.

[4] In reference to methodology, it is to be clarified that a land belonging to Forest Department does not become a forestland automatically. But if a land is primarily used for a conservation activity, it is a forestland irrespective of possession or ownership.

Government should also form a State Level Committee consisting of at least PCCF, Forest Secretary, NGOs, and a representative of the Government of India. On the basis of feedback obtained from various quarters, taking the view of Forest Survey of India, the Committee should finalise the list of forestlands submitted by the district level committees. The Committee should then submit a report to Central Government for formal approval of the list. Past reports prepared by the State Governments should also be analysed. Since some States prepared those report in haste, corrections should be made now. This final report would then be the benchmark for all future decisions under FCA.

Background and Appeal

The author had discussions with forest officers from time to time especially during their refresher courses in Indira Gandhi National Forest Academy, Dehra Dun. There was no unanimity among them about the meaning of the word 'forest'. Most of them, however, accepted that just an abstract definition of the word 'forest' on the basis of vegetation density only would not help and to make the FCA practicable ecological considerations are extremely important. The parameters used in this article may be frowned upon, yet a line has to be drawn somewhere. The formulae and calculations apparently quite complicated, are much simpler than various calculations, to which the foresters are already used to. Moreover, simpler tabular form is also enclosed herewith for ready reference. Therefore, it is requested that every reader should ponder for a moment and see if the article serves the purpose or they can prescribe better parameters or these parameters could be quantified in a better way.

SUMMARY

The Apex Court has clarified that with a view to check deforestation, the word 'forestland' occurring in section 2 of Forest Conservation Act, 1980 will include 'forest' in dictionary sense in addition to recorded forest irrespective or ownership or classification thereof. Most of the States could, however, not define the 'forest' in dictionary sense due to confusion about minimum vegetation density and minimum areas for consideration. For proper application of FCA, ecological consideration should also be given due weightage. Small areas should be excluded from the definition of forest unless there are rare and endangered flora and fauna. Large wilderness areas, devoid of trees, which are free from human interference, should be considered forest. The areas between 1.0ha with density 1.0 and 100ha with density zero should be treated as forest. The values in between could be calibrated on the basis of exponential decrease in density. Plantations raised on non-forestlands should not be treated as forest.

वन संरक्षण अधिनियम में बताए अनुसार वन भूमि की पहचान करना

एन०सी० बहुगुणा

सारांश

सर्वोच्च न्यायालय ने निर्वनीकरण की रोकथाम की दृष्टि से यह स्पष्ट कर दिया है कि वन संरक्षण अधिनियम, 1980 की धारा 2 में आने वाले "फारेस्ट लैण्ड" शब्द में वन अभिलिखित हुए शब्द के अलावा, उसके स्वामित्व अथवा उसके वर्गीकरण से निरपेक्ष, कोशगत अर्थ में लिया गया 'फारेस्ट' (वन) भी सम्मिलित रहेगा। बहुत सारे राज्य इस सम्बन्ध में विचारणीय न्यूनतम वनस्पति घनत्व और न्यूनतम क्षेत्र विषयक उलझन के कारण

कोशगत अर्थ में 'फारेस्ट' (वन) को परिभाषित नही कर पाए। वन संरक्षण अधिनियम को समुचित रूपेण लागू करने के लिए पारिस्थिकीय धारणा पर भी उचित बल दिया जाना चाहिए। छोटे–छोटे क्षेत्रों को इस परिभाषा से तब तक बाहर रखा जाना चाहिए जब तक कि वहां कोई दुर्लभ एवं संकटापन्न पेड–पौधे और पशुपक्षी न विद्यमान हों। बडे–बडे क्षेत्र जहां वृक्ष न लगे हों, जिनमें मानवों द्वारा हस्तक्षेप न किया जा रहा हो, वन भूमि (फारेस्ट लैण्डस) ही माने जाने चाहिए। 1.0 हेक्टे० क्षेत्रफल के 1.0 घनत्व और 100 हेक्टे० क्षेत्रफल के शून्य घनत्व के मध्य पड़ते क्षेत्रों को घनत्व में घातांकीय घटत आधार पर स्वांकित किया जा सकता है। गैर–वन भूमियों पर लगाए रोपवनों को वन नहीं माना जाना चाहिए।

References

Bahuguna, N.C. (2004). What is a forest? An Analysis of the Forest (Conservation) Act. *Indian Forester*, **130** (7): 719-730.

Gupta, S.K., G.S. Paliwal and R.M. Singhal (2001). Forest and Forest Laws: Need for a more Acceptable Definition. *Ind. J. For.*, **24**(1): 80-82.