PROTECTED TREES IN THE FORESTS OF UTTARAKHAND

V.K. DHAWAN, S.R. JOSHI AND ISHA RANA

Silviculture Division,
Forest Research Institute, Dehra Dun (India).

Introduction

Hundreds of trees are protected as living natural monuments in India and occupy an important place in the country's history. These trees, known for their grandeur and majesty are like the green pearls of the Indian crown. Trees have always been associated with wisdom and immortality in India. Hindu literature describes a celestial tree as having its roots in heaven and its branches in the underworld, which unites and connects beings of every kind. Banyan is the National Tree of India. Peepal, banyan (Bodhi tree), banana, mango etc. are some of the plants that hold special cultural and religious significance in Uttarakhand. Shisham, deodar, banj, kikar, sal, khair, teak, chir are some of the popular trees that grow in Uttarakhand.

The concept of protected trees was initiated after the conservation of natural forests came into force from the early periods in India. It was at the International Forestry Conference at Rome in 1926 that "Protection of Natural Features" was discussed as an important subject matter of the day and a resolution was passed requesting all countries to take steps for preservation of threatened species of "Amenity Forests and Public Parks" and so on. Later, H. G. Champion, Silviculturist, Forest Research Institute in 1929 mooted the idea of establishing preservation plots and protected trees at the Third Silvicultural Conference, 1929. This movement for the preservation of individual trees, groves and forests had, by then, already been active in most Western countries. As a result, a resolution (Resolution No. 22) was passed in the Third Silvicultural Conference, clearing the way for establishment of preservation plots and protected trees in the country.

The preservation of groups of trees of exceptional interest was also discussed and recommended. S.K. Seth in 1951 had compiled annual Silvicultural reports in which he emphasized on distinguishing three types of Preservation Plots that also have some specific trees of special interest which were to be protected. 'Special interest' meant the exceptional growth of trees, purpose of those trees were for seed collection or collection of planting material for raising good quality of planting stocks and development of germplasm beside keeping monumental status of the trees.

With most of the attention being accorded to 'Preservation Plots', the subject of 'Protected Trees' appears to have fallen into neglect by the time the country became independent. Bhadran (1958) gave the first comprehensive account of "Giant Trees of India" in which he enlisted 171 such trees of the country. He however, admitted that

the list of trees was neither complete nor comprehensive but represented only a first attempt of such a compilation. He also mentioned that only trees over 100 inches (2.54 m) girth at breast height had been listed. According to him, the oldest living tree in the country was that of *Cedrus deodara* (deodar) existing near old F.R.H., Nandal Banihal Range, Ram Ban Forest Division in J & K. The tree had a girth at a breast height of 456 inches (11.58 m) and was estimated to be over 1,200 years old. It may be mentioned that Uttarakhand continued to be the only state which meticulously maintained its record of protected trees in the state. The state has a giant deodar tree in Preservation Plot No. 1 of Kanasar range of Chakrata Forest Division. It has a girth of 6.35 m, height of over 42 m and it is over 400 years old. Asia's giant teak tree is situated in the Kannimara Range of Perambikulum National Park, Kerala. It has a girth of more than 3 m. Uttarakhand State has some monumental trees of chir, sal, semul, shisham, spruce and fir protected in different Preservation Plots situated in different forest types. The Western Ghats and Palini hills of Tamil Nadu also have some trees in their forests, which are of special interest. The famous biggest banyan tree is found in the Botanical gardens, Calcutta and in the gardens of Theosophical Society, Adyar, Chennai (Tamil Nadu).

The apical growth of the tree becomes very fast during the first few years and then it slows down as compared to the radial growth. The growth however ceases when the tree attains maturity. The maturity period of trees varies from species to species. The growth of trees to some extent depends upon the seed origin/ planting material and inheritance characters but much of the growth is found influenced by the edaphic, climatic and existing environmental conditions. It is observed that the growth of trees are found to be more in Wet-evergreen/ Semi-evergreen forests of India as compared to the trees grown in other forest types due to higher rainfall. Trees are also protected by the people in the form of sacred groves around the temples and villages in Uttarakhand since time immemorial.

Survey of Protected Trees

In the year 2007-08, the authors from Silviculture Division of Forest Research Institute, Dehra Dun visited Preservation Plots of Uttarakhand and adjoining Siwalik forests of Uttar Pradesh and observed protected trees, which were marked and indicated in the records. The trees were enumerated in surveyed plots and are presented in Table 1. With the creation of Rajaji and Corbett National Parks, some of the plots from other forest divisions have been merged within these National Parks. The collections of data in respect to the Preservation Plots have been discontinued after 1975. The survey team thus faced difficulties in searching the locations of trees in the plots.

It was observed during the survey that the protected trees still have markings on their stems. The list in Table 1 covers only living trees over 1 m girth that are still standing. Survey is being continued in the forests and trees are marked which can be protected and utilize for further research.

Table 1

Enumeration of protected trees in different forest types of Uttarakhand

Sl. No.	Location	Situation (Long.; Lat.)	Altitude (m)	Name of Protected Trees	GBH (cm)	Height (m)	Main species in the forest.
1	2	3	4	5	6	7	8
1	Preservation Plot no. 1, Kanasar Range, Comp. No.8 Chakrata Forest Division, Chakrata.	77°50'E 30°4"N	2031.25	*Cedrus deodara* *Cedrus deodara* *Cedrus deodara* *Cedrus deodara* *Cedrus deodara*	635 550 473 365 395	42.00 37.00 43.00 44.00 47.00	*Cedrus deodara* forests only.
2	Preservation Plot no. 9, Mundali Range, Comp. no.8b Chakrata Forest Division, Chakrata.	77°57'30"E 30°50'N	2439.02	*Cedrus deodara* *Cedrus deodara* *Cedrus deodara* *Cedrus deodara* *Cedrus deodara*	347 340 457 476 603	46.00 43.00 42.00 36.00 41.00	*Cedrus deodara* with scattered *Picea smithiana, Abies pindrow* and oaks.
3	Preservation Plot no. 17, Mundali Range, Chakrata Forest Division, Chakrata.		2873.52	*Cedrus deodara*	337	53.30	*Cedrus deodara* with scattered *Picea smithiana, Abies pindrow* and oaks.
4	Preservation Plot no. 23, Deoban, Comp. no. 9 a & 5 b Chakrata Forest Division.	77°52'30"E 30°45'N	2972.56	*Cedrus deodara* *Picea smithiana* *Picea smithiana* *Abies pindrow* *Quercus semecarpifolia* *Piecea smithiana*	281 220 205 262 268 329	47.90 48.80 50.90 34.55 18.42 34.14	*Quercus semecarpifolia* with scattered *Abies pindrow* and *Picea smithiana.*
5	Preservation Plot no. 5 Garhwal Division, Badhangarhi Gwaldam-Tharali Road, near Karanprayag.	79°32'E 30°1'30"N	1892.85	*Pinus roxburghii* *P. roxburghii* *P. roxburghii* *P. roxburghii* *P. roxburghii*	411 360 368 403 367	64.63 61.28 56.09 47.25 60.97	*Pinus roxburghii*, with scattered shrubs of *Lyonia ovalifolia* and *Rhododendron arboreum.*

Contd...

1	2	3	4	5	6	7	8
				Shorea robusta	256	35.06	
				Shorea robusta	238	32.32	
				Shorea robusta	246	33.54	
16	Preservation Plot no. 12, Haldwani Division, Dogri Range, Jubliganj East, Comp. no. 1.	79°58'E 29°3'N	275	*Dalbergia sissoo*	139	26.42	*Dalbergia sissoo* with *Holoptelia integrifolia*. Sissoo under retrogression.
				Dalbergia sissoo	155	27.76	
				Dalbergia sissoo	135	24.46	
				Dalbergia sissoo	142	24.69	
				Dalbergia sissoo	129	27.03	
17	Preservation Plot no. 30, Tons Division, Deota-Balcha road, Temple Comp. no. 3 & 4.	77°56'E 30°1'30"N	2687.50	*Picea smithiana*	716	53.35	*Cedrus deodara, Abies pindrow, Picea smithiana* as top storey and *Taxus baccata* as underwood.
				Cupressus torulosa	711	48.17	
				Picea morinda	568	64.63	
				Cedrus deodara	210	49.69	
18	Preservation Plot no. 19, Dehra Dun Forest Division, Phandowala, Comp. no. 8 & 9 a.	78°2'E 30°12'30"N	579.26	*Shorea robusta*	745	25.91	Almost pure sal of good quality with usual associates of evergreen undergrowth.
				Shorea robusta	210	35.36	
				Shorea robusta	207	30.79	
				Shorea robusta	210	34.75	
19	Preservation Plot no. 20, Dehra Dun Forest Division, Song Block, Comp. no. 4	78°9'E 30°13'30"E	539.63	*Acacia catechu*	187	18.29	*Trewia nudiflora, Albizia procera, A. odoratissima, Toona ciliata, Ficus racemosa* etc. in the top canopy with a few residual *Bombax ceiba* and *Acacia catechu.*
				Syzygium cumini	170	21.34	
				Toona ciliata	167	24.39	
				Bombax ceiba	281	33.54	
				Trewia nudiflora	176	21.34	
20	Preservation Plot no. 21, Dehra Dun Forest Division, Golatappar, Comp. no. 7 b.	78°12'30"E 30°5'N	365.80	*Shorea robusta*	203	37.50	A moderately dense canopy of deciduous and evergreen species.
				Adina cordifolia	276	37.80	
				Terminalia alata	327	44.20	
				Shorea robusta	269	30.79	
				Shorea robusta	279	39.63	

Contd...

1	2	3	4	5	6	7	8
21	Preservation Plot no. 29, Dehra Dun Forest Division, Lambirau Block, Comp. no. 38.	78°10'E 30°13'30"N	609.75	*Shorea robusta* *Shorea robusta* *Shorea robusta* *Shorea robusta* *Shorea robusta*	226 228 215 230 241	33.54 30.48 35.06 32.01 36.58	Mainly pure sal with scattered *Lagerstroemia parviflora, Toona ciliata, Adina cordifolia* etc. and abundance of *Mallotus philippinensis*.
22	Preservation Plot no. 32, Dehra Dun Forest Division, Golatappar Block, Comp. no. 7 a	78°13'E 30°5'N	609.75	*Pterospermum acerifolium* *P. acerifolium* *P. acerifolium* *P. acerifolium*	96 112 98 112 101	24.39 32.32 31.37 33.23 26.52	*P. acerifolium* (Kanak champa). Overwood consists mainly of *Shorea robusta* with mixture of *Terminalia alata, Adina cordifolia* and *Mitragyna parviflolia*.
23	Preservation Plot no. 17, Rajaji National Park, Mohand, Chillawala, Comp. no. 3	77°57'E 30°9'30"N	580.72	*Shorea robusta* *Adina cordifolia* *Anogeissus latifolia* *Sterculia villosa* *Garuga pinnata*	198 297 193 226 274	31.09 28.96 31.09 20.43 25.61	*Shorea robusta* with usual associates and underwood.
24	Preservation Plot no. 18 Saharanpur Division, Mohand Block.	77°54'E 30°11'N	579.26	*Acacia catechu* *Terminalia belerica* *Anogeissus latifolia* *Terminalia alata* *Boswellia serrata*	152 241 185 180 220	21.04 22.56 30.18 25.00 20.42	An overwood of *Anogeissus latifolia, Boswellia serrata* etc. mixed with a few sal and other miscellaneous species in the understorey.

Fig. 1

Protected Deodar (*Cedrus deodara*) trees in Preservation Plot no. 1, Kanasar, Chakrata (Uttarakhand)

Fig. 2

Giant Deodar (*Cedrus deodara*), girth 6.35 m in Preservation Plot no. 1, Kanasar, Chakrata – enumeration being carried out in Jan 2008.

Fig. 3

Protected sal (*Shorea robusta*) tree in Lambi Rao block of Thano range in Preservation Plot no. 29.

Conclusion

The earth is warming at an alarming faster rate now a day. Climate change may impact ecological systems of the forests. It has been observed during the field visits that un-revived and unmanaged preservation plots with biotic pressure, viz. grazing, lopping, forest fires, illicit felling etc. have resulted in the elimination of some species and others being brought to threatened status. This affects regeneration of tree species. It was observed that in some forest areas regeneration of deodar, chir, chemp, bakli and sal, was found to be badly affected due to change in climate, infertility of seeds, change in ecology or pressure from invasive species. Therefore, there is an urgent need to examine the causal inhibitor factors affecting regeneration of these elite trees. The germplasm bank from these trees can be utilized for further studies and for plantation purpose.

SUMMARY

Hundreds of trees are protected as living natural monuments and are associated with wisdom and immortality in India. In Uttarakhand, some trees hold special cultural and religious significance like peepal, banyan, mango etc. It was at the International Forestry Conference at Rome in 1926 that Protection of Natural Features was discussed. In 1929 Sir H.G. Champion, Silviculturist, Forest Research Institute mooted the idea of preservation of elite trees along with establishment of Preservation Plots and resolution No. 22 was passed. In 1951 Seth distinguished 3 types of preservation plots. By the time the country became independent, the subject of Protected trees appeared to have fallen into neglect. In 1958, Bhadran, however, gave the first comprehensive account of Giant Trees of India including trees girth of more than 100 inches at breast height. The growth of trees depends on many factors like seed origin/parent material, inheritance characters, edaphic, climatic etc. Growth of trees has found to be more in Tropical Wet evergreen/Semi evergreen forests than trees in other forest type. In 2007-08, authors from Silvicultural Division of Forest Research Institute have visited Preservation Plots of Uttarakhand and adjoining Shiwalik forests of Uttar Pradesh and surveyed Protected Trees which still have markings on their stem. Fresh enumeration was also done at sites and presented in the present paper. It was concluded from the study that due to global warming and intense biotic pressure, regeneration has found to be abnormal. Increased biotic pressure threatened some existing species. There is need to examine the causal inhibitor factors responsible for establishment of regeneration and elimination of some species.

Key words **: Protected Trees, Preservation Plots, Global Warming, Biotic Pressure.**

उत्तराखण्ड के वनों में सुरक्षा प्राप्त वृक्ष

वी०के० धवन, एस०आर० जोशी व ईशा राणा

सारांश

भारत में सैकड़ों वृक्षों को सजीव प्राकृतिक स्मारकों की तरह सुरक्षित किया गया है और उन्हें प्रज्ञा और अमरता से भी जोड़ा जाता है। उत्तराखण्ड में कितने ही वृक्षों को विशेष सांस्कृतिक और धार्मिक महत्व मिला हुआ है जैसे पीपल, वट, आम आदि। रोम (1926) में हुए अन्तरराष्ट्रीय वानिकी सम्मेलन में प्राकृतिक विशेष स्थलों के सरक्षण पर विचार किया गया। सर एच०जी० चैंपियन, वन संवर्धनिक, वन अनुसन्धान संस्थान (1929) सुरक्षित भूखण्ड स्थापित करने के साथ श्रेष्ठ वृक्षों को सुरक्षित करने का प्रश्न उठाया और उस पर प्रस्ताव सं० 22 पारित किया गया। सेठ (1951) ने तीन प्रकार के सुरक्षित भूखण्ड निर्धारित किए। देश को स्वतन्त्रता मिल जाने से

सुरक्षित वृक्षों वाला विषय लगता है, उपेक्षा का शिकार हो गया। भद्रन (1950) ने भारत के महाकाय वृक्षों का प्रथम विस्तृत ब्यौरा प्रकाशित किया जिसमें वक्षोच्चता पर 100 इंच से अधिक परिधि वाले वृक्षों को सम्मिलित किया गया था। वृक्षों की बढ़वार बहुत से कारकों पर निर्भर रहती है जैसे बीज का उद्गम/मूल सामग्री, पित्रागति लक्षण, मृदीय कारक, जलवायु कारक आदि। अन्य वन प्ररूपों के वृक्षों की तुलना में उष्ण आर्द्र सदाहरित/अर्द्ध सदाहरित वनों के वृक्षों की बढ़वार ज्यादा रहती देखी गई है। 2007–08 में वन अनुसन्धान संस्थान, वनसंवर्धन प्रभाग के प्रस्तुत लेखकों ने उत्तराखण्ड और उसके साथ लगते उत्तर प्रदेश के शिवालिक वनों का पारिदर्शन किया और उन सुरक्षित किए वृक्षों का जिनपर अभिज्ञान चिह्न अभी बने हुए व सर्वेक्षण किया। कुछ स्थलों पर नयी गणना भी की गई और परिणाम इस अभिपत्र में दिए। अध्ययन का निष्कर्ष यह है कि वैश्विक का ताप वृद्धि और गहरे जैव दबावों के कारण असामान्य पुनर्जनन हो रहा है। बढ़ते जैविक दबाव के कारण कुछ विद्यमान जातियां ही विलुप्ति खतरे में आ रही है। इसलिए पुनर्जनन में बाधा उत्पन्न करने, उनकी स्थापना न हो पाने और वन से समाप्त हो जाने के कारणों का पता लगाना आवश्यक है।

References

Anon. (1929). *Proc. Third Silviculture Conference*, Dehra Dun, March 14-20.

Bhadran, C.A.R. (1958). Giant Trees of India. *Indian Forester*, **84** (6) : 318.

Seth, S K. (1951). *Manual of instructions on experiments, preservation plots, protected trees, statistical sample plots, linear increment plots and annual silvicultural reports.* Supdt. Printing and Stationery, Allahabad.