GROWING STOCK EVALUATION OF SUB-TROPICAL CHIR PINE FORESTS OF PAKISTAN

S. M. Nizami, S. N. Mirza , M. A. Quraishi and I. A. Khan

Department of Range Management and Forestry, University of Arid Agriculture, Rawalpindi, Pakistani.

ABSTRACT

The study was conducted to compare the present growing stock of sub-tropical pine forests of Murree hills in Pakistan with the standard values of growing stock of a Normal Forest. Stand table was prepared for the major timber species of the area (*Pinus roxburghii* Sargent*)* using fixed area plot method of sampling in entire area of 4323 hectares.

Comparison was made on the basis of the values for each tree diameter class given by Ahmed and Bashir (1959). The study revealed that in sub-tropical pine forest of Ghoragali, pole crop (24-36cm diameter) is in excess number and very few are present in mature ages (132-150cm diameter class). This means that growing stock of Ghoragali forest is quite deviated from the normal values in different diameter classes probably because of poor implementation of previous management plans and also due to mismanagement resulting from the ban on "Green Felling" imposed by the government earlier.

Key Words: Normal growing stock, **c**omparison, stand projection.

INTRODUCTION

Centuries ago a need arose in the Europe to provide regular supplies of timber and firewood to expanding centers of population from accessible forests. In France it led to the cutting of equal adjacent coups every year on a twenty years rotation and the method came to be known as *"Tire et Aire"* (Brasnett, 1953). Following this method, equal annual quantities of timber and fuelwood could be harvested while at the same time perpetuating the forest-provided the areas cut each year were immediately regenerated by natural means. The quest for an ideal type of forest capable of providing in perpetuity equal yield at highest possible levels led to the formation of the concept of Normal Forest in the 18th and early 19th centuries (Osmoston, 1968).

The normal forest is currently defined as "the forest, which has reached and maintained a practically attainable degree of perfection on all its parts for full and continued satisfaction of the objects of management". It is a yardstick against which an actual forest may be compared so as to bring the deficiencies, particularly for sustainable management with regards to volume of growing stock, age – or size –class distribution and increment.

MATERIALS AND METHODS

Ecologically, Ghoragali forest sub-division lies in the sub tropical Chir Pine forest zone of Pakistan. It is spread over an area of 4323 ha and comprises of three blocks namely Sambli (1729ha), Ghoragali (1386 ha) and Angori block (1208 ha).

A sampling intensity of 2.5% is normally selected in these forests because of density and inherent diversity of the growing stock (Hussain, 1993). In each sample plot following parameters were studied: number of trees in each diameter class, increment of at least one of the tree of each diameter class, full age and top height of the mean tree of each diameter class.

Present stand table was prepared by laying overall 893 sample plots. Percentage of trees, which were present in a particular diameter class, was calculated and compared with that of a normal forest given by Ahmed and Bashir (1959).

RESULTS

According to Ahmed and Shabir (1959)**,** the normal forest should contain a minimum of 30% of total number of trees in diameter class 6-24cm, 20% in diameter class 24-42cm, 13% in diameter class 42-60cm, 10% in diameter class 60-78cm, 8% in diameter class 78-96cm, 7% in diameter class 96-114cm, 6% in diameter class 114-132cm, 6% in diameter class 132-150cm. Figures1 and 2 show the percentage of number of trees in entire diameter classes in Normal Standard Forest and in Ghoragali Forest Sub Division respectively.

Present study revealed that 27% of the existing trees fall in diameter class 6-24cm, 23% in diameter class 24-42cm which is greater than a normal forest, 21% in diameter class 42-60cm, 17% in diameter class 60-78cm, 7% in

diameter class 78-96cm, 4% in diameter class 96-114cm, 1% in diameter class 114-132cm, 0% in diameter class 132-150cm (fig: 2).
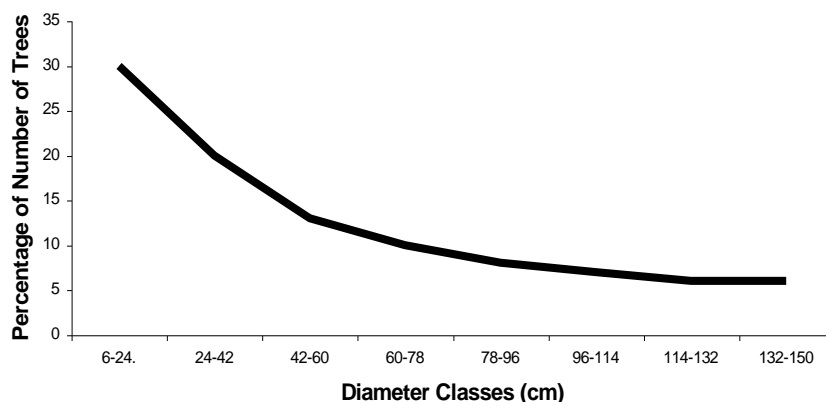

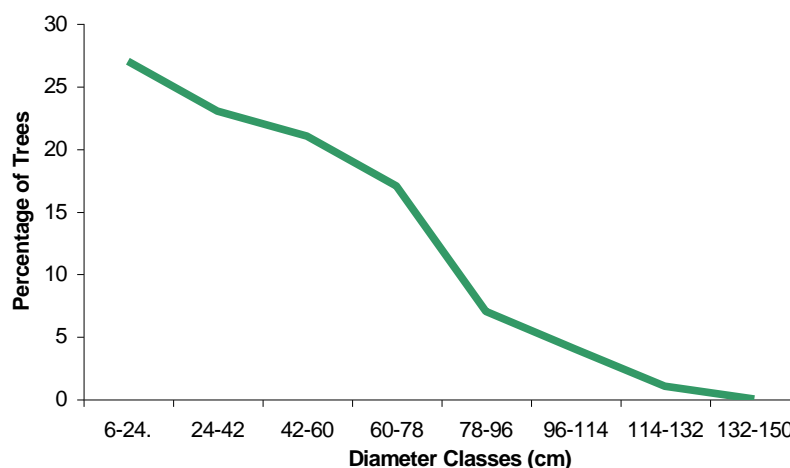Fig.1. Percentage of number of trees in all diameter classes in a normal standard forest.

Fig.2. Percentage of number of existing trees in all the diameter classes in Ghoragali forest sub division.

DISCUSSION

The study clearly showed that presently the Ghoragali forest has deviated from the standard forest values given by Ahmad and Bashir (1959) and Khattak (1965). There is a need of various management strategies to control the size structure by controlling the lopping and illicit felling (Rizwan, 1997).

Qureshi (1961), made an inventory of these forests and prescribed selection cum improvement, protection cum soil conservation and recreational working circles. The results of the management showed that stocking per hectare was increased.

Khan (1971) prescribed the same working circles and the result showed an increase in growing stock volume.
There is a ban on green felling in the forests of Murree since 1990 (Rahim, 2000) due to which the regeneration of the climax species (*Quercus*) is coming in large numbers as compared to commercial species of *Pinus roxburghii* Sargent. Chir Pine (*Pinus roxburghii* Sargent) is light demander and fire resistant species (Sheikh, 1993). The regeneration of chir is decreasing because of the increasing shade of broad-leaved *Quercus* species. So, there is a need of felling *Quercus* and mature trees of Chir pine, which have completed their rotation.
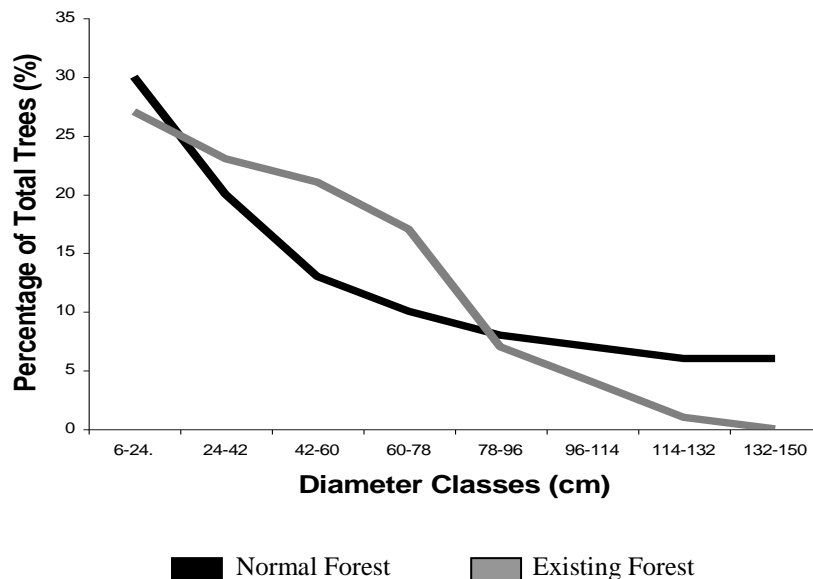
Fig.3. Comparison of percentage of total trees in existing and normal (standard) forest in different diameter classes.

CONCLUSION

In order to cope with the needs of stakeholders and to bring the forest more closer to standard values of a normal forests, the present shelter wood system of management should be changed to any modified system like group selection system which requires felling of small groups of trees from all over the forest keeping in view the topography and silvicultural characteristics of chir pine for stimulating free natural regeneration. An un-even aged forest will result having all the age classes distributed over the whole forest. Such a system will be known as modified selection system.

REFERENCES

Ahmad and Bashir (1959). *Revised Working Plan for the Murree- Kahuta Forests,* West Pakistan Government Printing Press, Lahore.

Brasnett, N.V. (1953). *Planned Management of Forests.* George Allen and Unwin, London

Champion, S.H;, S.K. Seth and G.M. Khattak (1965). *Manual of General Silviculture of Pakistan* -Pakistan Forest Institute, Peshawar. pp 30-91.

Davis, K.P. (1960). *Forest management: regulation and valuation*, 2nd edition. McGraw-Hill Book Company, New York: pp. xi + 519.

Government of Pakistan (1996). *Statistics of forestry sector master plan for all the provinces*. Ministry of Environment, Local Govt. and Rural Development. pp 291-309

Hassan, A. (1996). *Elements of Forest Mensuration*. Punjab Forestry Research Institute- Faisalabad. pp. 77-91.

Khan, A. (1971). *Working plan of Murree Forest Division –Murree Hills*, Punjab Forest Department. pp.211-222.

Khattak, G.M. (1965). *Forest Management.* Pakistan Forest Institute, Peshawar. pp.65.

Osmoston, F.C. (1968). *The management of forests.* Aberdeen University Press. pp.119-129

Qureshi, H. A. (1961). *Working Plan of Murree Forest Division for the period 1962-71*. Development and working plan circle Punjab Forest Deptt. Lahore. pp 40.

Rahim, S.A. (2000). *Working plan for the Cantonment Forests Murree Hills for the period of 1997-98 to 2006-07*. Punjab Forest Department.

Rizwan M. and M. Shamin (1997). *Working plan for the Forests Murree Hills for the period 1997-98 to 2006-07*. Punjab Forest Department.

Sheikh, M.I. (1993). *Trees of Pakistan*. Pakistan Forest Institute, Peshawar.

Walayat,R.H. (1998). *Research and Research Methods*. Pakistan Forest Institute, Peshawar. pp 36-49.