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Estimation of Wood Volumes in Karore Forest, Pakistan

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Abstract:

Pakistan is a forest deficit country with only 4.8 % Forest area of the total land mass. There is a huge lack in the sustainable production of wood and wood products. The national forests and plantations does not fulfill the overall timber as well as packing wood requirement. Therefore, most of the wood is imported to meet the need. The study was undergone to estimate the timber and packing wood (chip board material etc.) yield in the Karore forest of Pakistan. It is located in Rawalpindi-North subdivision in Punjab province of Pakistan. Its elevation is 1258 meters. The key species of this area is Chir pine (Pinus roxburgii) but the region comprises of scrub vegetation. Random sampling was performed to develop the volume tables of the forest distinguishing the timber and fuel wood volumes. There was assessed a hazard of forest fires every year that reasons the decline in the mean annual increment due to burn losses in the forest.

Key words: Wood material assessment, growth hazards, forest inventory, sub-tropical chir pine forest, Pakistan.

Introduction

Intense deforestation is in practice since early 90s in Pakistan. With a forest area of 4.8 percent it is unmanageable to meet the

countries timber as well as fuel wood requirements. As per as timber is concerned the import of good quality timber is in practice. For packing wood and other wood materials there were just a few industries working out of which some are shut down due to raw material impresence and other issues (Shahbaz *et al.,* 2006). Most of the Forests present in Pakistan are in the Northern parts of the country i.e. Khyber Pakhtunkhwa, Gilgit-Baltistan and Azad Jammu and Kashmir regions. Rest of the national forest requirement relies on these areas. Concerning the agroforestry practices and forest plantations contribute to less than 1 percent of the countries forest. There has been intense cutting of the forest in 1999 onwards as the forest area faced a decline of 3.6 percent. However, a study depicted that the annual decrease in forest is 1.2 percent. (Suleri, 2002)

The study was performed with the objective to estimate the wood material volume in a forest of Pakistan. This is required to cite down the availability of the raw material and propose a sustainable utilization of the resources. The left over from the tree after making lumber is used as fire wood most commonly. Although it is a high national interest for fuel wood consumption but there may be adopted environmental friendly and cheap products for this purpose i.e. briquettes. In case the material wood left from the lumber may be utilized in the industries for packing wood purpose and others. (Qamar, 2011)
Terracing is practiced extensively for land use and harvesting of agriculture crops and livestock practices. The common business in locality includes transportation and poultry farming. Water availability is a constraint in the area. It receives a rainfall about 70 inches per annum. Climate is mostly cold and moist winters and cooler summer with desiccating winds. Aspect of the forest is mostly northern. The wildlife of the area comprises Porcupine which is also a pest for the trees as it feeds on the rootstock. Other wildlife is snakes, spiders, scorpions, diverse avifauna species (Hashmi *et al.,*

2014). The objective to conduct the study was to estimate the timber and wood raw material volume of the standing forest of Karore to develop further studies on broader level and implementation.

Methodology:

The forest inventory was undergone in the Sub-tropical Chir Pine forest of Karore, a subdivision of Rawalpindi-North and falls under the administration of Punjab Forest Department. The study area was selected on the basis of ease of access and insufficient research undergone in the region. Study was conducted to estimate the volume tables of Subtropical Chir pine forest of Karore in Pakistan, a reserved forest. Terrain of the region is a hilly with village community and scattered pattern of land use. Altitude of the study area is 1258 masl. The population of the region is around 1200 individuals. As indicated earlier, the name shows, the climax species of this area is Chir pine (*Pinus roxburgii*), other shrubs and some fruit species like apricot and peach were seen under agro forestry practices by the local community.The aim of the inventory was carried out to calculate the volume of the forest stand in Karore forest. The estimation was performed using the forest volumetric equations. Random sampling was carried out.

The volume tables were developed and the industrial wood material was estimated using ten percent of the total volume (Bousquet, 2001). Different studies reflects this ratio is acceptable for the estimation of wood volumes used for industrial use i.e. chip board, wood dust etc.

Results:

The study is the review cum research performed in the forest area for estimation of the wood volumes. Following table (Table-1) defines the calculated values of the Karore forest and

also the estimated industrial raw material from the calculated data.

Table-1: Estimated Wood Volumes

DIAMETER CLASSES	Total average volume (cft)	Estimated Industrial Raw Material (cft)
10.5-15.4	49.13166764	4.913166764
15.5-20.5	62.07200694	6.207200694
20.5-25.5	86.72162559	8.672162559
25.5-30.5	96.25280929	9.625280929
30.5-35.5	111.1949551	11.11949551
35.5-40.5	127.9746082	12.79746082
40.5-45.5	135.8276201	13.58276201
45.5-50.5	142.7929609	14.27929609
50.5-55.5	162.2063427	16.22063427
55.5-60.5	178.5276624	17.85276624
60.5-65.5	178.0805602	17.80805602
65.5-70.5	174.4817579	17.44817579
70.5-75.5	172.6477483	17.26477483
75.5-80.5	183.4760634	18.34760634
80.5-85.5	147.5008523	14.75008523
85.5-90.5	165.4067137	16.54067137
90.5-95.5	42.40728705	4.240728705
95.5-100.5	44.91780556	4.491780556

The table shows the values with respect to different diameter classes. Total volume of the forest is calculated according to the total area of the forest i.e. 20000 hectares. These calculation include the taperness factor for chir pine i.e. 0.3 (Hashmi *et al,* 2014). It was observed that the total wood volume of forest is 2261621047 cubic foot (ft^3). While the industrial raw material wood was estimated 4523242.095 ft^3.

Other species present the forest area and nearby wild locality includes sanatha (*Dedonea vescosa*), garanda (*Carissa spinarum*), anaar (*Punica granatum*), lantana (*lantana kamara*), narr (*Narium species*), Khajur (*Phoenix dactylifera*), kahu (*Olea ferruginea*), Tecolemlla (*Tecolmella undulata*), Coniza (*Coniza species*), Mazri leaves (*Nannorhops ritchieana*), Fruit tree (*Prunus species*) mainly.

Conclusion:

The study is the approach towards the estimation of raw material wood in the standing forest. This idea can be applied to a broader scale of large forests and implementation. The introduction of bio briquettes instead of the fire wood can be a worthy replacement in terms of environment and economy both. Second aspect is the utilization of these raw woods in the industries. Further studies can be conducted to refine and develop more sustainable utilization ideas and methods for use of the natural resources.

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