

REGENERATION STATUS OF *DODONAEA VISCOSA* IN MALAKAND FOREST DIVISION

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ABSTRACT

The research study was conducted in a Malakand Forest Division area to ascertain the current natural regeneration status of *Dodonaea viscosa*, and correlate its regeneration intensity with respect to slope, aspect and fuel wood collection area, and to find out the total number of sapling in Malakand Forest division of *Dodonaea viscosa*.

Presently 55.83% regeneration represents 'Poor regeneration' 25.83% shows 'fairly good regeneration' while 18.33% indicates 'Good to excellent regeneration'. It was estimated that there are 1, 66, 78,779 Seedling/saplings in the whole Malakand Forest Division. The maximum regeneration was found on South-western aspect whereas minimum were found on the North-eastern aspect.

INTRODUCTION

The Malakand forest division is located between the latitudes 34°37' and 35°00'N and longitudes 71°37' and 72°40'E, at the northern side of Khyber Pakhtunkhwa Province and southern aspect of Gilgit Baltistan. The survey area (Malakand Forest Division) falls in sub tropical zone characterized by Sub Tropical Scrub Forest at the lower elevation and Sub Tropical Broad Leaved Ever Green Forest at the higher altitudes, having 4631 hectare (20700 Acre) forest area. These forests not only provide fodder for livestock, but also local community with fuel-wood and non-timber forest produce like olives and Chir gum. Malakand forest division is subordinated by Divisional Forest Officer (DFO) and having one divisional forest office at Batkhela. There is one Sub-divisional forest office at Dargai and one Range Forest Office at Batkhela Subordinating by Sub-Divisional Forest Officer (SDFO) and Range Forest Officer (RFO) respectively.

People of the area also fulfill their daily fuel wood and timber requirements from these forests. On eastern side, it is characterized by mountains of various altitudes while River Swat flows to the western side of the division. In between, the habitat is characterized by lush green agricultural fields, vast barren grounds, foot hills, mountains, many perennial and seasonal streams, and Bella to pine forests. Owing to diversified habitat, this Division has great potential for wildlife conservation. All the four species of partridges (Chukar, See See, Gray and Black partridge) are found here; besides partridges, pigeons,

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doves, quails, falcons, hawks, hares, jackals, fox, porcupine, and many other wildlife species use this area as an abode. Several species of falcon visit this area. The River Swat and perennial streams provide staging grounds for different species of waterfowls migrating during winter season providing sport opportunity to the hunters. Moreover, Malakand is a business centre and serves as a transit point for export of different wildlife species from northern parts of the province. (Anon 2012)

Dodonaea viscosa is being lost at an increased rate, mainly as a result of rapid population growth, greater socio-cultural compulsions, and the scarcity of alternative means of livelihood.

Because of socio-political and tribal environment, conventional approaches to conservation, as shown in various official directives and rules, and the limited capacity and resolve of the Forests and Wildlife Departments of the provincial governments of Khyber Pakhunkhwa, have been of little help either in controlling the unsustainable harvesting of *Dodonaea viscosa* in Malakand Forest Division or taking any preventive measure for the protection of *Dodonaea viscosa*.

Objective of the study

Following is the objective of the study:

1. To ascertain the current natural regeneration status of *Dodonaea viscosa*
2. To find out the total number of seedling/sapling in the study area.
3. An impact on ecosystem because of the fuelwood uses by the locals.

REVIEW OF LITERATURE

Relevant literature was thoroughly reviewed to know the regeneration status of the subject species.

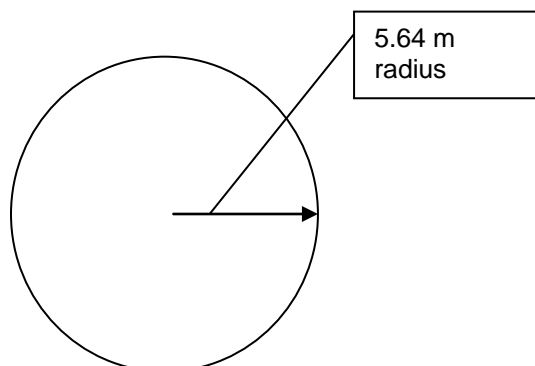
MATERIAL AND METHODS

Field/Forest survey

1. Methodology Adopted

For the field measurement, prefixed plot/grid sampling technique was used. Keeping in view the time, cost and crop variability and terrain etc, a total of 120 plots were taken in the forest, using 0.1 % sampling intensity. Size of each plot was 0.01 hectare (0.02471 Acres) with circular shape having 5.64m radius

(shown below). Total number of plots (120) were equally divided in the area such as 1 plot over 100 ha (247.1 Acres) or 1 km².



For equal distribution of these plots and to avoid biasness, a grid was drawn on the known scaled map of the area. A map having scale 1:50000 was selected and a grid of 2 x 2 cm (100 ha according to the scale) was fixed on it. Sample plot was taken in the center of each grid. In the map, position of the plots was taken with the help of toposheet of the area.

Distribution of sample plots

Five sites were selected for sampling plots in the whole Malakand Forest Division. Three sites were from Dargai Forest Sub-division: each site was at the hills of Totai, Khanoray and Palai. Two sites were from Batkhela Forest Range: each site was at the hills of Totakaan and Thana. 25 sampling plots were assigned to each of the above-mentioned areas. Total of 120 sampling plots were selected from the whole Malakand Forest Division.

Questionnaire Survey

A questionnaire survey was conducted from the local community to get information about the importance, income and regeneration status of the *dodonaea viscosa* and any change they felt in the regeneration status and causes of perceived change within the past ten years.

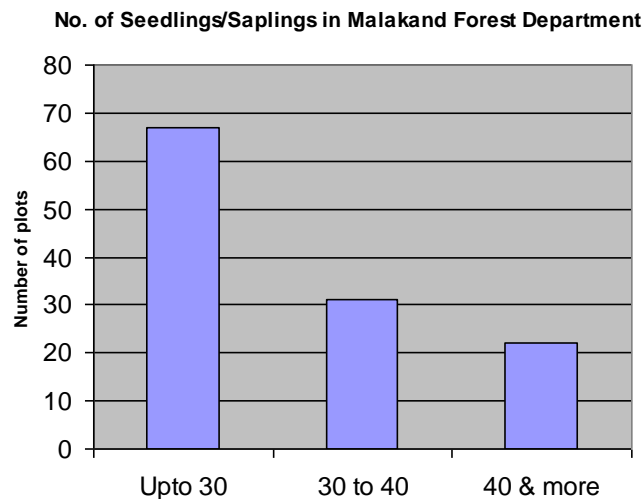
RESULTS

Regeneration status

To ascertain the regeneration status of *Dodonaea viscosa*, the data was arranged in three groups—poor regeneration, medium regeneration and good regeneration. A sample plot having up to 30 saplings was classed as "poorly regenerated", plots with 30-40 saplings were called "medium" while plots with more

than 40 saplings/ 0.01 ha was classed as having "good" regeneration respectively. The survey indicated that 67 sample plots (55.83%) have a very poor regeneration 31 plots (25.83%) have a fairly good regeneration while 22 plots (18.33%) have good to excellent regeneration. Considering the above calculation, it was estimated that there are 1, 66, 78,779 Seedling/saplings in the whole Malakand Forest Division.

Poor regeneration, medium regeneration and good regeneration was presented graphically as will.



An impact on ecosystem because of the fuelwood uses by the locals

In the whole Malakand Forest Division, people facing severe shortage of fuelwood, as there is scarcity of the alternative source of fuelwood energy. The Locals can not effort LPG (Liquefied Petroleum Gas) on regular bases, and use forest as fuelwood on domestic as will as for commercial purposes. Beside this the Agroforestry is not will establish to fulfill fuelwood demand of the locals. Some people in the area are far off from commercial area, and fuelwood (*Dodonaea viscosa*) are easily available to them. (Anon 2010).

Some locals are permanently living in hilly sites, they are unaware of the forest importance, so they use natural resources unsystematically. These peoples are called "Gojar", economically, they are dependent on livestock. For the survival of their livestock, they use rangeland beyond the carrying capacity, and was causing a lot of damage to the regeneration of *Dodonaea viscosa*. The sp is clear cut and brought to the local market (Dargai Bazar) for selling (Personal observation). Interviewer elaborated that mostly women and children collected fuelwood in the study area.

Following impacts on ecosystem were noted because of excessive deforestation of *Dodonaea viscosa* forest as fuelwood.

- According to the locals there were perennial springs in the study area that became dry. In Dargai Sub Division (at Totai, name of village) the interviewer said that during last decade many springs in Hazar Nau hills became dry. Fishes present in these springs ultimately became wind off.
- The locals use to clear cut *Dodonaea viscoa* and bring them to local market for selling. Wherever the sp was cleared cut, the area subjected to surface runoff, causing heavy soil erosion (small scale mass movement were also noticed).
- According to the staff of wildlife department, *Dodonaea viscosa* is a good habitat for black partridge, but due to the excessive collection of sp as fuelwood, habitat was destroyed on one hand and severely eroded through the movement of fuelwood collectors on other hand.
- Destruction of regeneration while trampling by human/camel/donkey feet during fuelwood collection, caused forest ecosystem disturbed.

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**Specimen
Performa for data collection**

Date	Slope	Aspect Northern or Southern	Fuelwood collection intensity	Number of seedling	Other plant Observed	Name of the area	Date