Restoration of Mothronwala Fresh water Swamp of Doon valley, Uttarakhand

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Abstract: Doon valley has many fresh water swamps, due to its unique topography and peculiar situation in the foothills of Himalaya. One of such swamp is Mothrowala fresh water swamp, where the present study was carried out. During the study it has been observed that over a period of few decades the vegetation of the swamp has been disturbed to a great extent for want of fuel, fodder and timber. Due to this indiscriminate and unscientific exploitation of swamp by the local people, the swamp is degrading, depleting and reducing day by day and loss their natural beauty. The vegetation structure of this swamp is also changing as consequences of these disturbances, resulting is that more hardy exotic and invasive species such as *Eupatorium adenophorum, Lantana camara* and *Parthenium hysterophorus* are invading and thus replacing the indigenous flora. [Researcher. 2010;2(7):53-55]. (ISSN: 1553-9865).

Key words: Mothronwala; fresh water swamp; restoration; doon valley

1. Introduction

The Mothronwala swamp forest is a localized vegetational complex where water logging is a constant feature. This forest has not been classified hitherto. Champion (1936) in his classification of forest types of India recognized several kinds of mangroves and swamp among the edaphic forests. The moist tropical mangrove forests of India could be divided into sub-type viz, Beach forests, Tidal forests, Delta forests, Delta fresh water swamp forests and Tropical valley fresh water swamp forests. Tropical fresh water swamp forests represent the serial stages from open water to close forest canopy and lead to the development of tropical rain forest (Richards, 1966). The water percolated deeper in the soil during heavy rain fall in the mountain reappears in the form of several artisians, springs and streams in the foot hills (Tarai region) creating a water logged soil. Mothronwala swamp forest with several artisians in the form of bubbling pools and the vegetation entirely different than the surrounding is also known as tropical fresh water swamp. Mothronwala swamp possesses peculiar vegetation due to topographic and edaphic variations. However, increasing population and developmental activities resulting in continuous encroachment upon forestland, many swamp areas have shrinked in and around Doon valley. Today only a few small and scattered patches of swamps are left between the base of the outer hills of Himalayas in the north and the Siwalik Hills in the south.

Kanjilal (1901) focused attention towards the great botanical potential of the swamp forest in Doon valley. He described Mothronwala, Nakraunda, and Golatapar swamp forest in his work for their great botanical interest. Puri (1960) called these forests as Tropical valley fresh water swamp forests and Champion and Seth (1968) termed them tropical hill valley forests. Mothronwala fresh water swamp is one of the important swamp of Doon valley where the present work was carried out. For last few decades the vegetations of swamp have been changed due to the exploitation of swamp by their local people. Resulting is that, it loss their aesthetically and ecological value. It is need to conserve for their economically, ecologically and aesthetically value. The aim of the study was to explore the species richness and suggest the conservation strategies to restore this valuable ecosystem of doon valley.

2. Material and Methods

2.1 Study area

Mothronwala swamp forest a compact area of 22 acres lying approximately at 30^0 15' north latitude and 78^0 2' east longitude is situated a little on the north of the confluence of the rivers-Suswa, Bindal and Rispana. It lies about 5 Km from the main city of DehraDun at and elevation of 600 m. The forest derives its name due to its close proximity to village Mothronwala, situated on the east of the forest on the bank of the Rispana. On the west lies across Bindal the Clementown a military establishment and on the north the Banjarawala tea state.

2.2 Methodology

The area was frequently surveyed. Usual methods

of collection, preservation, and maintenance of specimen in herbarium were followed (Jain and Rao, 1977). Several attempts were made for collection in different seasons. During the field study the specimen of plants with flower and fruit were collected. Collections of plant species were made throughout the year. After collection, the specimen were processed, preserved and mounted on herbarium sheets.
The herbarium sheets identified from the Botanical Survey of India, northern circle, Dehradun and deposited in the Herbarium of Ecology Research Laboratory, Botany Department, D.A.V (P.G) College Dehradun.

3. Results and Discussion

During the study 277 species of flowering plants were collected which was very less in the comparison of Daxini (1960). Daxini (1965) reported 367 flowering plants in this area. He gives the vegetational formula of the area as 38 Trees +52 Shrubs+ 42 Climbers + 235 Herbs. In present the forest of this region has depleted at a much faster rate during last four decades. The presently vegetation structure of swamp are 25 Trees+ 34 Shrubs+ 25 Climbers+ 193 Herbs. Kanjilal (1901) and Dakshini (1965) reported many interesting plants which are now absent or if still present, they are in the form of stumps. Kanjilal (1901) described the high altitude plant *spp;* such as *Qurecus incana, Olea grandulifera, Acer oblongum, Pterospermum acerifolium, Celtis australis* etc., in the shady moist ravines of Mothronwala swamp. Dakshini not reported these plant spp, but he mentioned the stumps of *Quercus incana, Acer oblongum* and *Olea grandulifora* in his report.

During the study it is resulted that, biotic interference is the major cause of the depletion of the floristic diversity and degradation of the swamp. The major consequences of degradation are:

- Deforestation of tree for timber
- Firing
- Unscientifically lopping of trees for fodder
- Illegal digging of medicinal plants likes *Centella asiatica, Bacopa monerii* etc
- Consumption of *Rorripa nasturtium aquaticum* and *Diplazium esculentum* as vegetable
- In addition to various anthropogenic threats cited above, the swamps are facing serious problem of pollution in recent times. The water quality of these swamps, which is quite pure and potable at origin, starts deterioration along the stream. The main reason for this degradation in water quality is irrational use of water by inhabitants for domestic and agriculture purposes.
- Eutropication or algal blooming is also cause of degradation; this increases biological oxygen demand and affects the growth of aquatic flora and fauna.
- Siltation is another most common problem faced by these swamps. The higher deforestation rate results in loss of topsoil, which is drained off with rainwater and settles down in the stream. This result in rise of soil level in swamps making them much shallower and with reduced water spread area.

4. Conclusion

The study concluded that there is a need of so many ecological study of this area, because this swamp is one of the important swamp of Doon valley due to its unique biodiversity. Following conservation measure should be follow to protect this natural asset of Doon valley.

Conservation Strategies:
Mothronwala fresh water swamp is under severe threat due to human interference and other anthropogenic activities. As a consequence, the following measures are of utmost importance to check their further deterioration.

- The knowledge of the physical dimensions of this swamp by way of field surveys and other appropriate techniques like remote sensing etc. should be gained.
- Inventory of both flora and fauna in this swamp should be made and rare, endangered and economically important species should be given top priority for their protection. Since deforestation in the catchment area due to human interference, has adversely affected these swamps, it is necessary to go for large-scale afforestation in these areas.
- There should be a regular testing and monitoring of the water quality of these swamps. The water samples need to be taken from the disturbed areas along the stream at regular intervals to judge the adverse effects of human activities.
- Efforts should be initiated by the State Forest Department to protect these swamp forests from further destruction by enforcing strict laws and warding penalties on defaulters who are harming these ecologically sensitive zones by over exploitation of resources, cutting and lopping diversion of water for irrigation and agricultural and urban land use.
- To make people aware of the importance and threats to wetlands and their conservation, various government institutions, NGOs and media (both print and audiovisual) should take the lead and make it a mass movement.

- Besides sensitizing the people, the school children also need to be made aware of the need to save the wetlands.
- Local communities should be involved to ensure sustainability of conservation effort under taken by the government agencies. For this, they can be involved in decision-making processes required for management and conservation of wetland.
- A holistic approach is required for conservation and management of these wetlands. Only then we can ensure the proper management and conservation of these fragile ecosystems, which can serve as a valuable resource for coming generation.

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References

[1] Champion HG, Seth SK. A revised survey of the forest types of India. Manager of Publications, Govt of India, New Delhi 1936;404.
[2] Champion HG, Seth SK A revised survey of the forest types of India. Manager of Publication, Govt. of India, New Delhi 1968;404.
[3] Dakshini KMM. A study of the vegetation of Mothronwala Swamp forest Dehradun. Ind. J. Ind. Bot. Soc. 1965;44: 441-448.
[4] Jain, Rao. A Handbook of field and Herbarium methods. Today & Tomorrow's printers & Publishers, New Delhi 1977.
[5] Kanjilal UN. Swamp forest in Dehradun, N.W. Province. Indian Forester 1901;27:228-230.
[6] Puri GS. Indian Forest Ecology. Vol I Oxford Book and Stationary Co. New Delhi 1960; 228.
[7] Richards PW. The tropical Rain-Forest. An ecological study. Cambridge Univ. Press 1966.