

CHAPTER-X

HIMALAYAN FOREST RESEARCH INSTITUTE SHIMLA

The Himalayan Forest Research Institute (previously 'High Level Conifers Regeneration Research Centre', 'Conifers Research Centre', 'Temperate Forest Research Institute') with headquarters at Shimla came into being during 1977 primarily to investigate the causes of failure of natural regeneration of Spruce and Silver Fir, the most common conifer species of western Himalayas occupying approximately 31.13% of the total area under conifers in the states of Himachal Pradesh, Jammu & Kashmir and Uttar Pradesh. At present the mandate of the Institute includes studies on various aspects of forestry in different eco-vegetation zones and tackling issues related to agroforestry and mine rehabilitation in the states of J&K and H.P.

PROJECTS COMPLETED DURING 1997-98

NIL

OLD PROJECTS CONTINUED DURING 1997-98

Project 1: Cold desert afforestation and pasture establishment (under FREEP).

Sub-Project 1(1): Select Suitable Species for Planting including Trees, Shrubs and Grasses and to Develop Effective Establishment Techniques.

Objectives: (a) Ecological survey of cold desert areas to select suitable species for afforestation. (b) Survey to determine the occurrence and extent of *Juniperus macropoda* stands in cold desert regions of H.P. (c) Study of species composition, plant biomass and net primary production in certain alpine pastures of Western Himalayas. (d) Development of nursery and planting techniques of *Fraxinus xanthoxyloides*, and *Quercus ilex*.

Achievements

Herbarium of different plant species were prepared. The phyto-sociological data great variation in frequency, density, dominance, etc. due to difference in sites altitude and aspect. Draft report has been prepared.

Assessment of ecological status of *Juniperus macropoda* has been made in various valleys of Lahaul & Spiti. An exercise for comparing the present day status of the species with relevant details in compartment history files of the various ranges in the district of Lahaul & Spiti was also taken up. The soil analysis showed a pH range of 5.3 to 5.9 and the values of electrical conductivity from 0.05 to 0.35 mmhos/cm. Maps of the stands have also been prepared for a number of sites.

The experiment on depth and density of seed sowing was repeated and it was observed that seed depth of 2 cm and 50 seeds per line and lines spacing 20 cm apart in a bed-size of 2 m X 2 m gave the best results for two consecutive years of study.

Experiments on optimum depth of sowing and optimum time of seed collection were repeated during the year. Trial on transplanting techniques was also initiated. In this case winter sowing showed quite good germination. Appropriate depth of sowing was found to be



Mine reclamation : A rehabilitated site



Demonstration plantation in forest lands



Nursery raised stock of spruce



Acer caesium in the nursery

about 4 cm with 40 seeds per line in a bed size of 2 m X 2m and lines spaced 20 cm apart. A preliminary report has been prepared.

The trial on optimum depth of sowing was repeated and trials on the performance of seed sources along with time of sowing were continued during the year. On compilation of the results it was found that the winter sowing showed quite encouraging results even in the repeat experiments. The seeds as from Tabo & Pin Valleys were found to be the best performers amongst 8 different provenances collected and tried in the nursery conditions. A draft report has been prepared.

Sub-Project 1(2): Improved establishment of Clonal Wood Species.

Objectives: (a) Studies on different soil working techniques for afforestation of slopes and low-lying areas in the cold desert areas. (b) Studies on planting techniques of Poplars in cold desert areas. (c) Performance testing of different provenances of *Populus ciliata* and other Poplars in nursery and in field conditions.

Achievements

The sites for laying out the proposed experiment was selected. The developmental activities including fencing was also done.

The analysis of data have shown that the pit size of 60 cm³ when planted with sets of dia-class varying from 19-24 cm gives the best results in case of *Populus alba*.

The plants were cut back in the beginning of the year and various growth attributes were recorded. The nursery trials have recently been concluded and a draft paper is being prepared.

Project 2: Regeneration of coniferous and broadleaved forests.

Sub-Project 2(1): To Examine the effect of introduction of poplars into degraded coniferous forests.

Objectives: Improvement of Fir and Spruce regeneration through introduction of *Populus ciliata* as a nurse crop in degraded Fir-Spruce Forests.

Achievements

Inter-planting of Silver fir was only done in Narkanda whereas both the species are under trial in Kullu. Plants of *Populus ciliata* have been planted in the field. Various growth attributes were recorded. The recordings of phyto-sociological details were also taken up. On computation of the data, it has been concluded that there is no changes in floristics and life-form composition in herbaceous flora. No significant changes have so far been observed because of the fact that crown of Poplar has not yet been fully developed.

Sub-Project 2(2): Develop improved propagation, nursery and planting techniques.

Objectives: (a) Determination of seedling grade for field planting of Silver fir. (b) Studies on grafting techniques of *Pinus gerardiana*. (c) Improving growth and establishment of *Pinus gerardiana* in field conditions. (d) Studies on the performance of seeds from different sources of *Pinus gerardiana*. (e) Studies on seed dormancy of *Taxus baccata*.

Achievements

Experimental site was maintained and gap-filling was done. Recording of data was also started. On computation of data, the results indicated that survival percentage increases with the health/vigor of plants.

The stock for grafting was maintained. Training was imparted to research personnel. Some scions to standardize grafting techniques have been made.

The experimental plot was maintained and recordings of growth data and addition of fertilizers at regular intervals of time taken up as per Annual Action Plan. Gap filling was also done, however, replacements were marked to keep such seedlings out of recordings so that they may not interfere with the experimental details. Application of fertilizers showed significant effect on survival and growth of the species during the period.

It has come to light that seeds collected from the Jungi area of district Kinnaur are the best performers.

It has come to light that in case of *Taxus baccata* there is no seed coat dormancy. Whatever delay in germination is there, can be ascribed to embryo dormancy itself. Results indicate approximately more than 20 weeks are required for breaking the dormancy in this case.

Project 3 : Planting stock improvement programme.

Sub-Project 3(1): Establishment of Seed Production Areas (SPAs).

Objectives: Identification and location of seed stands of *Pinus roxburghii* and their development into SPAs.

Achievements

Marking of Chir trees in 28.94 ha area for its development into SPA has been completed. Candidate Plus Trees (CPTs) – 26 in numbers -- have been selected. Screening of these CPTs have also been done from entomological and pathological point of view. Sample plot analysis and enumeration results for the SPA have also been completed. The culling percentage varied from 35-47% by number and 24-36% by volume in case of Kopra & Dibkan forests respectively.

Sub-Project 3(2): Establishment of Seedling Seed Orchards (SSOs).

Objectives: (a) Establishment of SSO of *Pinus roxburghii*. (b) Establishment of SSO of Shisham.

Achievements

Site for raising 5 ha SSO of Chir-pine has been finalized in Shun forest of Kunihar Forest Division. Preliminary works have been taken up.

2 ha of SSO of Shisham has been raised in consultation with Chief Technical Advisor (CTA) - Shisham. To achieve the remaining targets, 3 ha area has been selected in Nalagarh Forest Division and fencing and other developmental works of the site have been taken up. Seed from 27 CPTs have been collected from the states of Uttar Pradesh and Jammu & Kashmir.

Sub-Project 3(3): Establishment of Clonal Seed Orchards (CSOs).

Objectives: Establishment of CSO of Shisham.

Achievements

2.27 ha CSO of Shisham raised earlier has been maintained during the period. Site for achieving the remaining targets have been selected in Basanterbela, Jammu & Kashmir.

Sub-Project 3(4): Establishment of Vegetative Multiplication Garden (VMG).

Objectives: Establishment of VMG of Shisham.

Achievements

A site for raising 2 ha of VMG of Shisham has been selected in Nalagarh Forest Division of Himachal Pradesh. The developmental works have been initiated.

Project 4: Himalaya Eco-Rehabilitation Project (IDRC aided).

Project 4(1): Eco-Rehabilitation of Mined and Other Degraded Areas.

Objectives: Rehabilitation of mine damaged areas with specific micro-interventions.

Achievements

A pilot project is under operation to assess and quantify damage due to mining and to develop ecologically and socio-economically sustainable rehabilitation package in the Paonta Valley of district Sirmour of Himachal Pradesh. Rehabilitation works taken up during the year included constructions of check-dams, gabion-structures, toe-walls, etc. along with plantations of various species such as *Robinia pseudacacia*, *Grewia optiva*, *Populus deltoides*, *Vitex negundo* and *Ipomea carnea*, etc. indigenous to the region.

Project 5: Strengthening and Developing ICFRE and its Institutes (UNDP aided).

Sub-Project 5(1): Increasing Forest Productivity through Genetically Superior Planting Material.

Objectives: Research in introduction of high yielding clones of *Populus deltoides* in agricultural systems in lower hills and valleys of Himachal Pradesh.

Achievements

This year, the agroforestry models taken up in Paonta Valley concentrated upon maximum out-put in-terms of tree/crop and simultaneously restoring the environment. This year 40,000 cuttings of *Populus deltoides* (G-3 & G-48 clones) have been raised in the nursery at Tokion. Gap-filling in the plantations taken up earlier was also done. Recording of observations from demonstration plantation and performance trial taken up under this project have been taken up.

Project 6: Increasing Productivity of Man-Made Forests (Plan funds - ICFRE).

Sub-Project 6(1): Introduction and Performance Trials on some Broadleaved Tree Species for Afforestation and Agroforestry.

Objectives : (a) Screening of different provenances of *Populus ciliata* by evaluating their performance in nurseries with special reference to Himachal Pradesh and maintenance of their germplasm. (b) Screening of different clones of *Populus deltoides* by evaluating their

performance in nurseries with special reference to Himachal Pradesh. (c). Trials on introduction of two species of *Paulownia* and their multiplication.

Achievements

The data is being analysed and draft paper will be prepared shortly.

NEW PROJECTS TAKEN IN HAND DURING 1997-98

NIL

EXTENSION

Imparted on the field training for raising demonstration plantations to the farmers of Paonta Valley under UNDP programme.

FINANCIAL STATEMENT

Sl. No.	NAME OF ACTIVITY/PROJECT	EXPENDITURE (Rupees)
A.	REVENUE EXPENDITURE	
a.	Research	26,52,165.00
b.	Administrative Support	17,13,303.00
B.	LOAN AND ADVANCES	96,875.00
C.	CAPITAL EXPENDITURE	1,34,282.00
	TOTAL (A+B+C)	45,96,625.00
D.	EXTERNAL AIDED PROJECTS	
	IDRC (Himalayan Eco-Rehabilitation	3,66,359.00
	UNDP Project (Strength ICFRE)	2,26,936.00
	World Bank Project	20,78,677.00
	Sub Total (External Aided Projects)	26,71,972.00
	TOTAL (A+B+C+D)	72,68,597.00