PROCEEDINGS OF THE INSTITUTE LEVEL SEMINAR OF HIMALAYAN FOREST RESEARCH INSTITUTE, SHIMLA HELD ON 28.02.2023

In the series of monthly seminar, a talk on **"Potential of Silvipastoral system in Livelihood, Productivity Enhancement and Restoration of Waste/Degraded Lands in North-Western Himalaya: Challenges and Opportunities"** under the theme *"**Managing Forests and Forest Products for Livelihood Support and Economic Growth"*** was delivered by **Dr. Swaran Lata, Scientist-D,** Silviculture & Forest Management Division on 28th February, 2023. All the Scientists, Officers, Technical staff, Research Scholars, Research and Field Station staff of the institute attended the seminar physically and online mode.

Dr. Sandeep Sharma, Director & Group Coordinator of Research, HFRI chaired the proceedings of monthly research seminar and welcomed the Dr. Sanjeev Kumar, Director of Research, Dr. Y. S. Parmar University of Horticulture & Forestry, Nauni (Solan), HODs, Scientists, Technical Officers, Research Scholars, Research and Field Station staff present and connected online during the seminar. Thereafter, he requested Dr. Swaran Lata, Scientist- D to make a presentation on the given topic.

In her presentation, **Dr. Swaran Lata, Scientist-D** described various issues related to "Potential of Silvipastoral system in Livelihood, Productivity Enhancement and Restoration of Waste/Degraded Lands in North-Western Himalaya: Challenges and Opportunities". She gave overview of population status, livestock status, land cover status, forest cover status, Human dependence on forests, major fodder sources, grazing lands, permanent pastures and productivity issues of India as well as in North Himalayan States & UTs. After that, the speaker shifted the focus towards green and dry fodder availability (deficit and surplus status) and desertification and land degradation status by showing the facts as per the report of ICAR- IGFRI, Jhansi; ISRO, Ahmedabad and Niti Ayog's Working group report. She further elaborated about the agroforestry, major components, types, potential and scope of silvipastoral systems in reducing pressure on existing forests, increase land and livestock productivity; compensate paucity of cultivable land resources and ecosystem sustainability. Dr Swaran Lata also highlighted the National Agroforestry Policy goals, India's commitment to achieve the land degradation neutral status by 2030 as signatory country of UNCCD, and main motive behind the setting up Centre of Excellence at ICFRE, Dehradun by honourable Prime Minister Shri Narinder Modi in UNCCD COP 14.

The presenter also talked on research work carried out on various aspects of silvipastoral systems in the past at global, national, organization and institution level along with the constraints, opportunities,

future strategies, research needs, networking and funding options. The presentation was concluded by emphasizing the research needs on various aspects of silvipastoral systems viz., introduction of improved high productive, fast growing leguminous tree/shrubs and grasses, optimization of tree density and spacing in silvipastoral systems, fodder bank establishment, development of agro-climatically suitable silvipastoral models, establishment of demonstration area in participatory mode, quality and certified planting material for farmers, herbage production and carbon stock improvement of degraded grassland/wasteland ecosystems and development of value added products of forestry species should be initiated/carried out in the future in the north western Himalayan states.

After that, **Dr. Sandeep Sharma** invited **Dr. Sanjeev Kumar, Director of Research, Dr. Y. S. Parmar University of Horticulture & Forestry, Nauni (Solan),** to deliver a lecture on **'Agroforestry and Silvipastoral Systems'** as external speaker. Dr. Kumar talked on various aspects of Agroforestry and Silvipastoral systems w.r.t, multipurpose trees, social, economic and environmental benefits of agroforestry and silvipastoral systems along with management and limitations. He also put emphasis on introduction of new varieties of grasses, leguminous shrubs and trees in silvipastoral systems for productivity enhancement of livestock and fertilization and restoration of degraded pastures/wastelands through institutional participation.

During the discussion, **Dr. Pawan Rana, Scientist-E,** raised query that although Himachal Pradesh has overall surplus green (43.9%) and dry fodder (55.9%) then how, Himachal Pradesh is facing problem of fodder scarcity. In response, Dr. Swaran Lata informed that in Himachal Pradesh major source of green fodder is pasture land followed by cultivated land and forests. Small ruminants form a major part of livestock here and they are mostly dependent on grazing lands. These surplus fodders are not fully utilized because of hilly and difficult terrains, thereby creating a practical deficit.

Dr. Sandeep Sharma, Director added that in Himachal Pradesh during lean period (winters) farmers of low, mid and high hill regions also depends on tree leaf evergreen fodder species especially *Grewia optiva, Bauhinia variegata, Morus* spp., *Quercus oblongata, Quercus semecarpifolia, Quercus dilatata, Quercus ilex* etc., to meet fodder and fuel wood needs. He further added that fodder requirements varies from place to place in some areas of Himachal Pradesh are fodder surplus and some areas are deficient thus in fodder deficient areas fodder needs of farmers can be fulfilled through silvipastoral interventions. **Dr. Pawan Rana** further said that there is dire need to work on "agro-climatic zone wise fodder availability status" to know the actual situation of fodder availability in Himachal Pradesh.

Dr, R.K. Verma Scientist G, added that total livestock population in Himachal Pradesh has shown negative trend over the years 1997-2019. Except for the 190.2 % growth of crossbred/ exotic cattle population in the state, all other including Indigenous cattle, buffalo, sheep and goat population has

shown negative growth. In response **Dr. Swaran Lata** said that this may be due to reason that crossbred/ exotic cattle (Jersey/Holstein Friesian) are constantly replacing indigenous cattle because in most of the rural areas for more milk production farmer's rear more number of cattle due to which fodder consumption remain high. Thus farmers prefer rearing of crossbred/ exotic cattle, as their milk yield per animal is higher than indigenous animals.

Dr. Balkrishna Tiwari, Scientist-B informed the house about the *Quercus ilex* based agro-silvopastoral systems in Spain and Portugal he further queried about the existence of similar systems in India. In response Dr. Swaran Lata said that in India natural silvipastoral systems also exist and *Q.ilex* based agri-silvipastoral and silvopastoral systems are available in India especially in Kinnaur and Bharmaur region of Himachal Pradesh.

Dr. Pravin Rawat, Scientist-B queried about the status of studies on economics of natural silvipastoral systems in Western Himalaya. In response Dr. Swaran Lata said economic studies of natural silvipastoral systems are not available for Western Himalaya.

Sh. Dushyant Kumar, Technical Officer opined that, through the introduction of new varieties of grasses, leguminous shrubs and trees in silvipastoral systems of Himachal Pradesh, farmers will get nutritious fodder which will contribute towards increase in milk production.

Outcomes of the seminar were as follow

A. Identification of research needs: As a result of discussion, it was agreed that in future research must revolve around;

- Development of models suitable across various ecological regions
- Development of silvopastoral demonstration area in participatory mode
- Linking government sponsored programmes (e.g., MGNAREGA in India) for restoration of degraded grazing lands
- Establish government-sponsored incentives (share of yield) to attract farmers
- In depth studies on pastures and migratory grazers
- Introduction of improved high productive leguminous and grass species for improvement of silvipasture
- Storage of fodder and silage preparation for winter months
- Improve accredited quality germplasm and also to make it available for stakeholders
- Increasing genetic potential of indigenous breeds
- Impart trainings on value added products for improving livelihood
- Providing education and training for all extension officers to promote silvopastoral systems

B. Formulation of future strategies/ road map: It was decided that the institute needs to work on following topics

- Germplasm collection, testing and improvement
- Providing quality and certified planting material to farmers
- Studies on dgro-climatic zone wise fodder availability status
- Improvement of SPS through introduction of improved high productive, fast growing leguminous tree/shrubs and grasses
- Optimization of tree density and spacing
- Development of fodder banks
- Development of market driven silvopastoral systems/models
- Development of Cost-effective extension models
- Encouraging agroforestry as a course curriculum in school education and motivating youths to grow and conserve trees
- Extension and capacity building programmes

C. Networking research options identified

GBPNIHESD, SKUAST, CSKHPKV, YSPUHF, ICAR, Agriculture Technology Management Agency (ATMA), KVKs, VVKs, Farmer's Associations, NGOs, SHGs, FPOs, and PRIs

D: Future research directions discussed for implementation and opportunities for funding

MoEF & CC, NMPB, MoRD, MoA, DST, DBT, NABARD, SERB, SFDs, MoTA, Tribal Development Department etc.

In the end, **Dr. Sandeep Sharma, Director** thanked the Speakers, Scientists, Technical Officers, Research and Field Station staff and all Research Scholars for their active participation and inputs for making the seminar successful.

Glimpses of Seminar