

Silviculture and agro forestry: why merger in the era of super specialization?

Opinion

Silviculture and Agroforestry are two important pillars of forestry and therefore in Indian forestry system both the branches have got their own importance in territorial and extension forestry respectively. However, in recent past the merger of Silviculture and Agroforestry was observed in some forestry colleges in India under National Agricultural Research and Education System (NARES). In this context, this article deals with opinion pertaining to why combining two important branches (Silviculture+Agroforestry) and forming as one branch “Silviculture and Agroforestry”. Further, recently awarding one combined degree with nomenclature as M.Sc./Ph.D. Forestry (Silviculture and Agroforestry) creating a confusion among academicians, researchers and stakeholders. However, when separate nomenclature already exists as M.Sc./Ph.D. Forestry (Silviculture) and M.Sc./Ph.D. Forestry (Agroforestry) in forestry colleges in India. Silviculture and agroforestry were separate branches for PG specialization and it holds merit in separate branches comparison to combined specialization. Then merger of two branches does not appear logical. Agroforestry which primarily govern agricultural crops and agricultural landscape with tree intervention whereas silviculture is primarily dealing with management of trees/forests. Silviculture is purely a branch of forestry whereas Agroforestry is equally claimed branch of Agriculture as well as Forestry.

Silviculture is as old as scientific forestry in the world with major objectives of management of natural forest, production of tree species of economic value, production of larger volume of wood per unit area, production of quality timber, reduction of rotation of tree and introduction of suitable exotics etc. On the other hand, agroforestry is a very important subject and need of the current time. Agroforestry is a land-use system that integrates trees, agricultural crops and/or livestock in a unit piece of land for enhancing productivity, profitability, livelihood support and natural resource management. In the present context, the rising demand of food and wood products are the basic needs, which can be achieved by agriculture and forestry by means of agroforestry. In the present scenario, land being a limited resource, expansion of the farm area is not possible; however, enhancing the efficiency of farm by integration of fast growing trees with agricultural crops as agroforestry is the only possible option.¹ The importance of agroforestry can be further categorized by planting trees outside the forest in the form of agroforestry/farm-forestry which is only substitute to meet the goal as required by national forest policy 1988² for increasing forest cover to 33% from the present forest-tree cover 24.56% (Forest cover 21.67% and Tree Cover 2.89% as per FSI, 2019).³ Agroforestry seems more important when it is estimated that around 64% of India's timber requirements are met from trees grown on farm lands. Agroforestry meets almost half of the total demand of 201m tons of fuel wood in the country and generates 450 labour days per hectare annually without negating farm productivity or income.⁴

Silviculture deals with art and science of cultivating trees. It is also defined as main branch of forestry dealing with establishment, development, care and reproduction of tree till its harvest. Silviculture is not just purely a biological science rather has relation with economics to raise the forest crops of commercial value. So its main

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Arvind Bijalwan,¹ Manmohan JR Dobriyal,²
Tarun Kumar Thakur³¹College of Forestry, VCSG Uttarakhand University of Horticulture and Forestry, India²College of Horticulture & Forestry, RLB Central Agricultural University, India³Department of Environmental Sciences, Indira Gandhi National Tribal University, India

Correspondence: Arvind Bijalwan, College of Forestry, VCSG Uttarakhand University of Horticulture and Forestry, Ranichauri, Tehri Garhwal, Uttarakhand, India, Tel 91 9412983808, Email arvindbijalwan276@gmail.com

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objective is to grow economic and commercial valued forests with quality of timber and not jungles but sadly we currently making natural forest as jungles on behalf of conservation. The establishment aspect of silviculture focuses on considering scientific aspects before establishment of plantation/forest. The establishment part of silviculture is mainly connected to types of plantation and details about topography and land, physiographic factors such as altitude, slope, aspect, vegetation etc, biotic factors, interaction of site factors, climatic factors (Macro and Micro climate), Soil factors, Irrigation/soil moisture, arrangement of seed/planting material and source and collection of quality seeds (Plus tree, straight and sound tree for seed collection etc), nursery development and management, season of planting, silviculture characters of tree etc. The development and care aspects of silviculture deals with growth and development of trees/forest, weeding, thinning, training and pruning, seedling, sapling, bole, pole and tree and cultural operations etc. The reproductive phase of silviculture reveals about natural and artificial regeneration, flowering and fruiting behavior, factors effecting reproduction, seed dispersal etc. Also silviculture deals with managerial angle of natural forest linking to high and coppice forests by applying different silvicultural systems which are the base of natural forest management. The above evidences categorically clarified that silviculture is covering major part of forest sciences. In regards to importance of silviculture, it is said that it is like Agronomy of forestry, as agronomy is the soul of agriculture⁵. Summing up above description, facts and importance of silviculture the merging silviculture with Agroforestry will jeopardize the spirit of specialization in forestry.

If we see the importance of agroforestry at national level, realizing the relevance and importance of tree farming outside the forest, India launched the National Agroforestry Policy during 2014 and India become the first nation in the world to adopt a comprehensive agroforestry policy. Considering the importance of agroforestry, during 2016, Government of India has permitted for the execution of Sub-Mission on Agroforestry (SMAF) under the domain of National Mission for Sustainable Agriculture (NMSA)

with a major aim of expansion of tree cover on farm land. National Agroforestry Policy, 2014⁵ clearly states that Agroforestry cannot succeed without the willing support and cooperation of the people. It is essential, therefore, to inculcate in the people, a direct interest in agroforestry, its promotion and development. This can be achieved through the involvement of educational institutions, right from the school education by encouraging agroforestry in course curriculum and motivating youths to grow and conserve trees. Then why we are narrowing-down the significance of agroforestry by prefixing silviculture with it? When on one hand there is demand to start undergraduate degree as B.Sc. in Agroforestry^{6,7} there is no point in merging Silviculture and Agroforestry in specialization.

Agroforestry covers all the economically viable, ecologically sustainable and productive areas related to agriculture and forestry and thus seems to be the need of the hour as green areas. The extremely applied and important aspect covered under agroforestry as of today are: Agroforestry systems; Industrial agroforestry- Pulp and Paper industry, Plywood industry, Composite wood industry, Timber industry, Saw mills, Matchbox industry; Value Chain in Industrial Agroforestry; Industrial wood based raw material procurement; Economic and Fast growing trees; Economics of timber in Agroforestry and Farm Forestry Systems; Crop Production; PPP based Agro-Farm-Forestry; Farm and Tree certification; Institute-Industry-Farmer based tri and quad partite agroforestry models; Climate Smart Agroforestry; Diagnosis and Design in Agroforestry; Multipurpose Trees; Fruit Trees; Fodder and Pasture Development; Soil and Water Management; Measurement and Post-harvest techniques of industrial Trees; Cultivation of Shade loving crops; Modern Plantation Technology; Carbon sequestration in farm trees; Agroforestry enterprise and trading; Agroforestry programs, Policy and legal framework; Value addition; Agro-Farm-Forestry Management; Wood Based Industry in India; Extent of Agroforestry in India; Commercial Agroforestry Models; Valuation of Agroforestry Models; Tree-Crop interaction and management; Food and wood productivity; Agroforestry for livelihood supporting projects and activities; Agroforestry and Phyto-remediation; Agroforestry and Food Security; Agro-biodiversity conservation; Agroforestry and Ecosystem Services; Economically

Feasible Agroforestry practices in India; Energy and Biomass plantation; CDM projects through agroforestry, carbon credits and agroforestry, carbon finance through agroforestry options, linking Small farmers to carbon finance, agroforestry and agro-ecotourism.^{6,8} Therefore, it is clear from the above facts that in the era of super-specialization narrowing-down the already specialize subject is not justified. Thus it is irrational and illogical to merge two independent important branches viz. Agroforestry and silviculture for science, society and stakeholders' perspective.

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Conflicts of interest

The author declares there are no conflicts of interest.

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