

# Need to reconnect theory and practices of silviculture for sustainable forest management in India

## Opinion

Though Indian forests have unique tag of British regime for scientific forestry but till today the productivity constraints of forests are major issue. Indian forests are managed by Government professional foresters or administrators while research in forest science carried out by professional foresters as well as forest scientists. The communication gap between theory and practice of forestry is widening as we still preaching conventional forest administration to government foresters. Further, academic foresters/ researchers are not having laboratory / field to implement their research which now focuses on exotics and farm forestry. The basic question is why exotics are so much in use and demand when indigenous fast growing trees has equal potential for forest plantations as well as industrial plantations. The historical plantations of Deodar and Chir pine in Himalayan hills, Tropical pines in North East and Central India and Teak in South India are few examples of old timber trees in India by Britishers. India represents 20 agro-ecological zones, 15 agro-climatic zones and 14 physiographic zones with diverse forest types along with variety of trees. Approximately 1000 trees species are found in India out of which 10-20% are in timber use and 5% are designated as major timber species. India is wrested with so many indigenous fast growing timber trees and has potential to meet the industrial demand of the furniture, paper and pulp, and plywood from short rotation of about 88m<sup>3</sup>. These Indian timber trees were not screened for their superiority, utilization and cultivation purpose which lead to promotion of exotics as they have well developed elite planting material and plantation technology (Silviculture). Barring the few planted trees/ forests the silviculture for major timber trees is still unexplored even after more than 150 years of research and development in Indian forestry.

The harvesting, extraction and marketing of wood products is a major issue in Indian scenario due to complexity of laws, policy and marketing. National forest policy 1988 and Forest conservation act, 1980 has totally cut the market and trade lines of wood produce from the forests. Further the complexity of marketing, monopolistic approach of forest department and policy derailed the silviculture of Indian trees in forests. When commerce in wood is restricted or banned so no silvicultural practices or system is followed for regeneration and improvement of the forest. The forest trees which were called renewal resources are now became dead stuff in commerce though they are providing ecosystem services. In many places due to ineffective monitoring and corruption promoting illicit felling of trees and government is loss for forest wealth, revenue and ecosystem benefits at present India is importing wood of more than 46000 crore (460 billion) rupees annually which is a significant quantum of foreign exchange loss for the products which India can produce easily and provide more employment opportunities.

Although a lot of churning of thoughts for indigenous timber promotion done at foresters and ecologist level but silviculturist and tree breeders not able to grasp on the field demand of these species due their unexplored silviculture. If we have developed their silvicultural

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technique on scientific basis for commercial exploitation they would have captured the wood market. The trees like Ailanthus, Gemlina, Melia, Anthocephalus, Acrocarpus, Erythrina, Thespesia, Dalbergia, Kigelia, Acaica hybrid, Mohagany, Toon, Adina etc. having a long list for their improved clonal material and plantation technology to meet our domestic demand. There is urgent need to promote native timber / wood species by developing a network project in different ecologies for full exploration of silviculture of these trees so that their plantations can be raised in forests and farm forestry/ agroforestry. Although an effort was under industrial agroforestry value chain project in south India with forward and backward linkages but the model need to be replicated in other regions. Forest department can reach out people for popularization with economic viable, practically feasible and market link developed model for farmers and their own corporations to adopt the same. We know forest is a major source of germplasm for trees and also for all kind biological system but unfortunate part is tree selection and improvement was remaining neglected. The productivity of Indian forests is very low 0.5-0.7 m<sup>3</sup>/ha/yr while demand by 2020 is expected 152Mm<sup>3</sup>. To augment the good quality planting material in natural forest plus tree selection/ good seed bearers for seed production with assisted natural regeneration will be more effective. In natural forests the few important trees need to be selected for raising planting stock and replanted in regular interval to enrich the quality stock for future. Its well known natural forest productivity cannot be same as plantations/ farm forestry trees but at least plan to improve 3-5 m<sup>3</sup>/ha /yr when planted forests globally have 20- 50 m<sup>3</sup> /ha/yr. After a long gap National working plan code 2014 suggested to include sustainable yield concept of forestry (SFM) followed by forest certification. Why Indian forest are not put on Sustainable Forest Management (SFM) mode rather complete ban on all silvicultural activities for improvement of forest growth and yield for such a long period. This approach widened the gap between preaching and practicing of forestry education in India as most of the application of silvicultural practices are not applied in forests. Though in some pockets there are National parks in forest area and there for wildlife habitat management some tending operations are carried out along with selective felling but not the silvicultural practices. The conservation forestry is in practice will not meet the wood demand without precision silviculture of important timber/ wood trees which has both long as well as short rotation and demand in the market for timber, furniture and other industrial products. This will also

lead to increase in productivity and bridge the demand gap in wood market. Natural forests are solely depending for restocking on natural regeneration specially in Reserve Forest (RF) and Protected Forest (PF) forests and in some cases they have assisted natural regeneration. The onus of productivity of forest lies on quality planting stock or seeds for regeneration or plantation which seldom priority of forest department. The awareness about the quality planting stock in timber tree species is very low comparison to fruit trees. In recent times some plantation trees for paper and pulp, plywood etc. got attention due to clonal material and quick returns in farm/ agroforestry but in forest areas even in Unreserved Forests (UF) it is yet to be adopted. Though in 2016, the then Forest minister Praksh Javedakar announces to give forest land to industries and people on PPP mode to grow plantations and Indian Forest policy 2016 (draft) and second draft (2018) advocated that one third of the government forest to be handed over to community in next one decade but we need political will and dedicated silviculturist to do forest/ plantation startups. Therefore, silviculture has to be reoriented in precision silviculture otherwise the productivity constraints will remain in Indian forestry. Therefore, it is time to rethink in era of globalization and climate change to harmonize the marketing procedures, felling rules and regulations, timber transit rules and policy to derive the benefits for larger interest of nation. This will ensure the effective human resource utilization in forestry and silvicultural practices adoption for strengthening economy of the

nation in India there is ample scope of forestry as well as agroforestry to enhance the wood production if forestry be freed from realm of the administrative foresters and make a separation between conservation forestry only in natural forests and protected habitats of wildlife and commercial forestry in other lands outside the recorded forest of the government without any restrictions. such practices are prevalent in Canada, Papua New Guinea, Australia, New Zealand etc. countries. Unless we promote forestry in professional way for commercial gain the preaching and practicing of forestry will remain in a state of illusion.

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### Conflicts of interest

The authors declare that there is no conflict of interest.