and customized fertilizer recommendations, with the hope that scientific information will lead seri-farmers to optimize fertilizer use and promote site-specific nutrient management involving soil test-based application of fertilizers for sustainable sericulture promotion.

Under the project, soil samples were collected from the field of sericulture farmers of northwestern Indian states with the help of Global-Positioning System by standard soil sampling procedure. The collected soil samples were analysed for pH, electrical conductivity (EC), organic carbon (OC), available N, P, K, S and micronutrients (Zn, Cu, Fe, Mn, B) in a mini soil lab named 'Mridaparikshak' developed by ICAR-Indian Institute of Soil Science, Bhopal[3]. The analysed soil data were uploaded on the SHC portal and digital SHC was generated for each seri-farmer with appropriate fertilizer recommendation.

SHC is a printed report which contains all details pertaining to a farmer and soil sample, soil test results, fertilizers/amendments recommendation, time of fertilizer application, including bio-fertilizer for mulberry crop. SHC displays the status of soil with respect to 12 parameters, namely N, P, K, S, Zn, Fe, Cu, Mn, B, pH, EC and OC. A total of 2000 digital SHCs have been prepared and distributed among sericulture farmers of northwestern Indian states with timely and balanced fertilizer dose and its application which is valid for next three years.

SHC is a beneficial scheme for farmers. It is helping sericulture farmers of northwestern Indian states to increase the productivity and quality leaf production of mulberry, which ultimately has an impact on the sustainability and profitability of Indian silk industry to make the country self-sufficient in silk production in the world.

1. Annual Report, Central Silk Board, Ministry of Textiles, Government of India. 2016–2017.
2. Rathore, M. S., Srinivasulu, Y., Kour, R., Darzi, G. M., Dhar, A. and Khan, M. A., *Eur. J. Biol. Sci.*, 2011, **3**, 105–111.
3. Singh, D., Chhonkar, P. K. and Dwivedi, B. S., *Manual on Soil, Plant and Water Analysis*, Westville Publication, New Delhi, 2005.

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# Increasing forest or forest cover in India

The Indian Forest Act 1865 defines 'forest' as in dictionary meaning as 'land covered with trees, brushwood and jungle'. Subsequent amendment of the Act in 1878 led to areas under plantation on barren land also included as forest. In the famous T. N. Godavarman Thirumalpad versus Union of India case in 1996, the Honourable Supreme Court of India referred to forest as in dictionary meaning, irrespective of nature of ownership and classification thereof[1].

The Forest Survey of India (FSI) considers all land parcels greater than 1 ha in size and with more than 10% canopy cover for assessing forest cover in India. The National Forest Policy 1988 proposed that India should have at least 33% of its geographical area under forest/tree cover. The FSI in its 2017 assessment, reported forest and tree (trees outside forest) cover in India at 24%, and to achieve the target of 33%, it would require adding about 28 m ha under forest/tree cover.

India has shown continual increase in forest cover from 65 m ha in 2001 to 70.8 m ha in 2017, but not without loss of existing forest. Arunachal Pradesh and Himachal Pradesh combined have lost 185 sq. km of forest under very dense forest (VDF) category, while Andhra Pradesh and Karnataka have added about 4255 sq. km under VDF between 2015 and 2017 (ref. 2). The loss of pristine rainforests could have been compensated with growth of monoculture plantations, as only managed plantations can show such quick results in a short period. What FSI clearly misses to publish in its State of Forest Report is the type of forest lost or gained.

While monoculture plantations increase forest cover and sequestration, do they improve biodiversity, provide soil and water conservation and support the livelihood of millions of forest-dependent communities? The important question then is should we increase forest or forest cover in India?

Ill-conceived forestry projects under the Clean Development Mechanisms aimed at increasing tree cover to harness carbon sequestration have over long term been detrimental to the ecology of the region and for communities[3]. Such afforestation practices can severely compromise ecosystem services, including hydrology, soil nutrient cycles and reduce biodiversity, as has been observed elsewhere[4,5]. Targeting increased forest cover in arid regions of India like Gujarat, Rajasthan, Maharashtra and Andhra Pradesh could have high trade-offs, as these states have high livestock populations that require open land for grazing[6] and the native grassland ecosystems are critical for conservation of species like Great Indian Bustard.

Forests in India have long been managed for their timber value, but the Forest Conservation Act 1980 and Forest Policy 1988 shifted forest management focus more towards conserving biodiversity and meeting the judicial needs of local communities. The National Working Plan Code (revised in 2014), based on which all forest working plans are made, envisages the same.

Targeting to achieve forest/tree cover set in National Forest Policy and India's commitment under the Intended Nationally Determined Contribution (INDC) to the Paris commitment, where it has been proposed to create 2.5–3 billion tonnes of carbon sequestration through additional forest and tree cover by 2030 (ref.

7) could shift the forest management intentions on increasing forest cover and sequestration only; this could have trade-off on biodiversity and other ecosystem services. The forest cover as an indicator to measure the well-being of forests is unreasonable and definition of the term 'forest' as perceived in national policies needs to be examined. The Draft National Forest Policy 2018 has not attempted to clarify on this.

Given India's varying biogeographic zones, what is required is a decentralized forest management policy, which will allow each state to have its own forest policy, make its own specific afforestation target and forest management practices as suitable to the ecological and social needs of the region and aimed at enhancing biodiversity, ecosystem services and livelihood support to rural communities than achieving mitigation or forest cover targets. Finally, there is clearly a need for larger debate on increasing forest or forest cover in India.

The views and opinions expressed in this communication are those of the author, and do not necessarily reflect those of IIHS.

1. Lélé, S., *Econ. Polit. Wkly*, 2007, **42**(25), 2379–2383.
2. FSI, India State of Forest Report, Forest Survey of India, Dehradun, 2017; http://fsi.nic.in/isfr2017/isfr-forest-cover-2017.pdf
3. Aggarwal, A., *Mitig. Adapt. Strateg. Global Change*, 2014, **19**(1), 73–91.
4. Jackson, R. B. *et al*., *Science*, 2005, **310**(5756), 1944–1947.
5. Bremer, L. L. and Farley, K. A., *Biodivers. Conserv.*, 2010, **19**(14), 3893–3915.
6. Nineteenth Livestock Census, 2012; http://dahd.nic.in/sites/default/filess/Livestock%20%205_0.pdf
7. http://www4.unfccc.int/submissions/INDC/ublished%20Documents/India/1/INDIA-%20INDC%20TO%20UNFCCC.pdf

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