

ancient mining activity both at Kolar and Uti mines could be established. In fact, the last statement by Raghu Nandan about proving/disproving the chronology itself supports our effort.

Though Raghu Nandan notes 'I do not agree with the statement of the authors about the absence of historical records pertaining to the episodes of ancient mining activity in Karnataka', this general statement needs to be supported by dates

in the context of historical episodes of a particular mine. We have already cited in the text about the antiquity of gold mines in Karnataka; identification of 300 ancient workings in Hutti–Muski schist belt; epoch of copper ore mining belonging to the Satavahana period, etc. However, we also acknowledge the work carried out by Raghu Nandan and Mishra for establishing historical periods of various mining activities in India.

1. Nagabhushanam, P., Prabhakar Sangurmath, Patil, M. L. and Sukhija, B. S., *Curr. Sci.*, 2008, **95**, 389–391.

P. NAGABHUSHANAM

*Tritium and Radiocarbon Laboratory,
National Geophysical Research Institute,
Uppal Road,
Hyderabad 500 007, India
e-mail: pnbngri@gmail.com*

Social forestry with timber trees: a role for village lakes, streams and rivers

Streams and rivers play a key role in the rural ecology and economy by maintaining the water-table, as sources of electricity and water, and as a means of transport. Similarly, the village lakes play a key role in the rural ecology and economy by maintaining the water-table and as a source of water (irrigation). About 9.5% of India's land area is covered by water bodies, whereby the cumulative length of the main rivers of India is over 10,000 km, while the cumulative length of their tributaries and streams may be of similar or greater length¹. As the streams and rivers flow through dense forests and through agricultural area, one may ask if the latter is an area where trees may be planted as a form of social forestry, along the lakes, streams and rivers, in analogy to the custom of planting trees along the highways and village roads.

In countries such as India, social forestry has been advocated and promoted in many regions to strengthen the rural ecology and economy, reduce the pressure on forests, increase the tree cover and also increase agricultural production^{2–4}. There are several factors that affect the success of social forestry for rural development, among which the soil conditions, water-table, cattle grazing, and labour-intensive tree planting are critical factors for success. It is generally accepted that increasing the number of bunds (checkdams) and tanks (artificial lakes) will improve the water table, as has been shown in many regions of India. It is generally accepted that alternative sources of energy for the villages and stall-feeding of cattle will reduce the pressure on forests. This may be essential for increasing the tree cover and ensuring the success of social forestry. By

increasing the number of village tanks and supporting the villages with renewable energy and electricity, social forestry would be strengthened considerably.

Some informal projects of this nature have been initiated before and after the first monsoon rains along some lakes near Bangalore, a few tributaries of the Cauvery and at Lake Nilshi near Lonavala (Maharashtra). In this case seeds of pongamia (bio-diesel), and mahogany and hone (furniture) have been planted in a few locations. It was noticed with interest that some farmers were already doing this near some rivers (eucalyptus). This could be done equally well with teak, sheesham, rosewood, deodar and other timber trees. In view of the good water-table in these areas, these trees would grow well and their seeds are distributed by the water and wind along the borders of the lakes, streams and rivers, thereby maintaining adequate density and diversity of timber trees. As these trees may be harvested only after 25–30 years, this may be considered as a long-term plan which would be beneficial for the ecology and economy of the villages. Given the importance of initiative, participation, responsibility and sense of ownership by the villages, the importance of joint forest management cannot be over-emphasized^{3,4}. This would be compatible with other forms of social forestry⁵ and agro-forestry. In the monsoon season when streams and rivers are in spate, this may protect the river banks from erosion, which would be an additional advantage for the nearby villages in the long term.

While it may be non-trivial at the present time to make realistic estimates of the economic value of this concept for the whole of India (timber and furniture),

some back-of-the-envelope calculations do suggest that the contribution to the rural economy and ecology would be significant. Given the importance of increasing the forest cover, strengthening the rural ecology and economy, and increasing agricultural production, the role of planting timber trees along the village lakes, streams and rivers may be significant. Importantly, this would strengthen the rural ecology and economy, enhance their experience of well-being, and may be extended to other countries in Asia.

1. River Map of India, <http://www.mapsofindia.com/maps/india/india-river-map.htm>
2. Pant, G. B., *The Forest Problem in Kumaon*, Gyanodaya Prakashan, 1922.
3. Report, Indian Institute of Forest Management; <http://www.iifm.ac.in/databank/jfm/moefres.html> faolex.fao.org/docs/texts/ind21949.doc
4. Sarin, M., *Unasylva*, 1995, **46**, 30–36; <http://www.fao.org/docrep/v3960e/v3960e00.htm>
5. John, J. E. and Louis, M., *Curr. Sci.*, 2008, **95**, 298.

JACOB E. JOHN^{1,*}
MELVIN LOUIS²
P. VERGESE SAMUEL³
SAMEER WADEKAR²

¹6A, 7th Road,
Nandidurg Extn,
Bangalore 560 046, India
²12, N Parekh Marg
Colaba,
Mumbai 400 001, India
³4, Dr Rajkumar Road,
Kammanahalli,
Bangalore 560 084, India
*e-mail: jacobjohn@gmail.com