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NEWS & VIEWS

Natural resources within plantations and their utilization/conservation

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Land, water, air and sunlight are the important natural resources and assets to the plantation industry. As in any other agricultural enterprise, plantation scientists and the managements have an obligation and bounden duty to protect, conserve and improve them for the good of posterity, while utilizing them to the optimal level for the benefit of the society.

Land

Large tracts of land, as much as 1.00–1.50% of an estate, often marshy, lie waste in plantations as they are not suitable to cultivate the main crop of interest to the management, such as tea and coffee (Figs. 1–3); weeds and jungle growth infest such areas, at times acting as alternate hosts to pests and diseases of the main crop. Such areas left bare are vulnerable to evaporation losses leading to depletion of soil moisture, resulting in likely depression of water table. Those marshes could be drained out and brought under cultivation of such crops as *Colocasia* ("chapa kalangu"), *Amorphophallus* ("yam","chana kalangu") "vetiver" and others that prefer/tolerate the wet conditions under tree cover of species like *Salix tetrasperma*, *Eugenia operculata*, *Lophopetalum wightianum* and *Terminalia arjuna* that grow in swamps; such an approach leads partly to reforestation, which in turn, helps in increasing humid conditions that protect microclimate.

Fig. 2. Uncultivated wasteland.

It is estimated that about 80 tonnes of bio-mass per hectare is produced annually in tropical forests. At a conservative estimate of 1%, 477.46 ha out of the 47,746 ha under large tea growers and corporate sector are lying waste in south India. The biomass lost in that area amounts to 38,196.80 m.t. annually; it has to be prevented.

Water

Narrow gurgling streams, often stifled with weeds and jungle growth, are not an uncommon sight in plantations (Fig. 4); these streams go nowhere in particular and are lost in open swamps exposed to evaporation (Fig. 5). It will be useful to direct them into water bodies created, if necessary, by de-silting swamps, capturing and conserv-

Fig. 1. Swamp lying waste.

Fig. 3. Marsh lying waste.

Fig. 4. A stream leading into forest.

Fig. 5. An exposed marsh with stagnant water.

ing rainwater during monsoon (Fig. 6); aquifers where possible should be formed.

Those water bodies should not be left exposed (Fig. 6); they should be surrounded by dense growth of tree species such as *Gmelina arborea*, *Acacia mangium*, *A. melanoxylon*, *Callistemon linearis*, *Saraca indica* and others (Figs. 7, 8) so that ambient temperatures are moderated and evaporation losses curtailed to a great extent. Vetiver, lemon grass and citronella could be grown along the embankments and bunds of such water bodies. The water sources created thus, could serve irrigation purposes of the main crop during the times of need. Additionally, the ponds could be used for pisciculture generating additional income.

The reforestation programme should extend to surround the plantation(s) to form "green-belts" and at the hill-tops to form "forest-caps". The programme should also embrace cultivation of green manure species such as *Sesbania* spp., *Crotalaria* spp. and *Glyricidia* spp. in marginal lands.

Fig. 6. Exposed guided water body.

Fig. 7. Water body surrounded by tree cover.

Air

The measures suggested would enhance the ambient humidity and combat temperature changes significantly.

Sunlight

All these efforts to enhance the green canopy and reforestation would automatically lead to capturing increased quantum of sunlight; chlorophyll, substituting for "solar batteries" captures solar-energy and preserves it within the plants in the form of carbohydrates.

Yet another benefit of the increased green canopy by reforestation, though coincidental, is "carbon sequestration!"

Fig. 8. Water body surrounded by tree cover.