

## A COMPILATION OF POTENTIAL ALTERNATE SHADE TREE SPECIES FOR TEA PLANTATIONS

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Tea (*Camellia sinensis*) is a shade loving plant, which is usually grown as a mono crop, under a canopy of shade trees throughout its life. Various physiological functions of tea are facilitated by shade, leading to sustain its vigour, yield and quality of the final produce. The 'tea - shade tree' ecosystem is manipulated to possess a microenvironment resembling forest characteristics. Of the four different tea growing agro-climatic regions in Sri Lanka, the recommended shade trees are confined to eight species: *Grevillea robusta*, *Albizia moluccana* and *Albizia chinensis* as high shade and *Acacia pruinosa*, *Acacia decurrens*, *Erythrina lithosperma*, *Calliandra calothyrsus* and *Gliricidia sepium* as medium shade. One species each from the two categories is usually grown at each location; pollarding and periodic lopping of high and medium shade respectively are practiced to ascertain the optimal shade levels of 10-40%. In order to achieve ecological, environmental and economic stability of the system and sustainable productivity per unit area over monocultural systems, exploitation of more number of species is of vital importance. This also imparts direct benefits of harbouring natural enemies of pests, moisture retention, nutrient and energy trapping, soil erosion control, biomass energy and organic matter addition and indirect benefits of C sequestration and opportunities for 'fair trade labeling' and eco tourism, biodiversity improvement, floral and aesthetic values and income generation.

The present exercise explored the alternative species considering climatic suitability and natural habitat, growth rate, plant height, root characteristics, pollarding/ lopping ability, stem and branching characteristics, canopy architecture, leaf characteristics such as angle, size, shape, orientation and shedding. In addition, competitiveness with tea for water and nutrients, biomass production, nitrogen fixation, availability of information on propagation and other silvicultural practices, harbouring pests and diseases of tea, food, timber, fuel wood values etc. were considered. Initial database resulted in over 230 potential species with native and introduced origins excluding trees for intercropping and diversification purposes. The most probable species identified in the initial exercise were *Adenantha pavonina*, *Adina cordifolia*, *Albizia odorissima*, *Alstonia macrophylla*, *Alstonia scholaris*, *Bauhinia racemosa*, *Bauhinia variegata*, *Berrya cordifolia*, *Bhesa*

### SESSION III: ECOSYSTEMS AND ECOSYSTEM MANAGEMENT

*zeylanica*, *Cananga odorata*, *Canthium montanum*, *Carallia brachiata*, *Cassia javanica*, *Cassia spectabilis*, *Cedrella odorata*, *Chukrasia tabularis*, *Dalbergia sissoo*, *Elaeocarpus amoenus*, *Elaeocarpus glandulifer*, *Enterolobium cylocarpum*, *Erythrina edulis*, *Erythrina fusca*, *Erythrina poeppigiana*, *Erythrina variegata*, *Filicium decipiens*, *Khaya senegalensis*, *Macademia ternifolia*, *Mallotus tetraeocevs*, *Mangifera zeylanica*, *Michelia champaca*, *Muntingia calabura*, *Parkinsonia aculeata*, *Paulownia fortunei*, *Peltophorum dasyrachis*, *Pentaclethra macroloba*, *Pongamia pinnata*, *Pterocarpus indicus*, *Sapindus emarginatus*, *Tecoma stans*, *Ternstroemia gymnanthera* and *Trema orientalis*, which belong to the families Anonaceae, Apocynaceae, Bignonaceae, Elaeocarpaceae, Euphorbiaceae, Fabaceae, Magnoliaceae, Meliaceae, Paulowinaceae, Proteaceae, Rhizophoraceae, Rubiaceae, Sapindacea, Theaceae, Tiliaceae and Ulmaceae.

The species will be exposed to further screening processes and pilot scale field evaluations at the Tea Research Institute and different tea growing areas respectively, prior to releasing the most promising selections for field use.