



World Agroforestry Centre
TRANSFORMING LIVES AND LANDSCAPES

Framework Species for Conservation and Development in Yunnan, Southwest China



1) Biodiversity hotspot- Yunnan has a globally significant proportion of rare and endemic species of plants and animals. An estimated 18000 plant species, representing 4.8% of the world's botanical diversity, occur in Yunnan. Out of 335 China priority protected wild animals, Yunnan has 243 species, accounting for 72.5% of China's total, 15% of which are species endemic to Yunnan. Over 5000 plant species are used by local people for food, fiber, dye, medicines, timber, oil, and other purpose.

2) Cultural diversity- There are 25 ethnic nationalities representing over 50 linguistic groups, each with its own traditional knowledge of plants used in agriculture and forestry. In recent five years, ICRAF and Chinese scientists have applied Participatory Technology Development (PTD) to incorporate local botanical knowledge on medicinal plants into agroforestry system, thereby encourage "civic science" in the Farmer Field School in the uplands of Yunnan.



3) Roof of Southeast Asia- The area of Southwest China (Yunnan Province) is the source of headwaters and major tributaries leading into several major rivers which reach and have impact on the lives of more than 600 million people in Southeast Asia. The headwaters of the Yangtze, Salween, Irrawaddy, Mekong, Black, Red, and Pearl Rivers are located within this montane region.



4) Tree-based agroforestry landscape- Characterized by great bio-cultural diversity and geophysical complexity, Yunnan supports an exceptionally rich and dynamic agroforestry systems, for example, resin based (*Pinus yunnanensis*), lacquer based (*Taxidodendron vernicifera*), spice based (*Zangthoxylum bungeanum*), nut based (walnut, chestnut and pinenut), temperate fruit based, timber based (*Cunninghamia lanceolata*, *Taiwania flousiana*), ecological services (*Alnus nepalensis*) agroforestry along the Gaoligong Mountain National Nature Reserve in Yunnan.



5) China's grain-for-green policy- or "Sloping Land Conversion Program (SLCP)" of converting steep cultivated land to forest and grassland is one of the most important initiatives to develop its mountain regions and support ecosystem service for downstream. It is an great opportunity for ICRAF to work together with Chinese scientists and governmental agencies by using right which 'appropriate' selection of "framework species" on the basis of 'right trees or species for the right place' in mountain landscapes.



6) Framework tree species- Those are indigenous, fast growing with dense spreading canopies which rapidly shade out weeds and provides habitats for wildlife. Over 50 endemic often rare and endangered with economic value have been selected and engaged in the nursery. A total of over 50,000 seedlings have been reproduced and transplanted in the two pilots.



7) Restoring forest ecosystem in buffer zones- The framework species approach for ecosystem restoration has been applied in Gaoligong Mountain Nature Reserve for buffer development with partnership of Baoshan Forestry Bureau. Participatory model of buffer zone management with active participation from local communities was developed.



8) Campaigns of local experts- Local experts on forestry, agriculture, flora and fauna were identified. Small projects on ecosystem restoration and livelihood development have been successfully implemented together with local experts in collaboration with Yunnan Forestry Vocational School and Baoshan Forestry Bureau in Yunnan.



9) Capacity building- capacity building is key to long-term sustainability of project. Since 2005, the ICRAF have trained 12 forestry protection officers, many young students from vocational school, organized two study tours in Chiang Mai. The critical knowledge on research of species penology, seed storage and germination, propagation method etc. was the focus in the first training. The later program on other hand emphasized on data collection and analysis.



10) How to plant trees- we attempt to disseminate the knowledge from the field to the school through developing field manual and curricula. Field manual for seed treatment and tree planting was developed for farmer. A text book titled How to Plant a Forest: Principle for forest restoration has been translated into Chinese and adapted as undergraduate curricula by Yunnan Forest Vocational School.

11) Gene bank for tree genetic resources- Besides in situ conservation of local knowledge including biophysical and socio-economic information have been documented, specimen for more than 100 species have collected and genetic resources of framework species stored at Kunming Institute of Botany.



12) Policy support initiative- March of 2007, we organized an International Workshop on Forest Restoration in Tengchong, Yunnan. A total of 83 participants including policy-makers from State Forest Administration, academics and NGO representatives from the regions actively participated in this workshop and highly appreciated the framework species approach.



13) Voice from Nature Reserve - "As a forest guard (of nature reserve), it is tough job; as a female forester, it is tougher. However with support from ICRAF project, my job becomes enjoyable now. I take responsibility for monitoring species phenology and collecting specimen. It not only enriches my knowledge for conservation, but more significant, I try to apply my knowledge to help local communities, who used to be the 'enemy' of our nature reserve. Local communities help us forest restoration"



14) Farmer's voice - "We used to plant a lots of pine. Although pine grows fast, the price of timber drops. Framework species provides a lot of options for different species. It is good for our ecology and economy. Now, we plant many species".



15) Rhododendron- Gaoligong Mountain Nature Reserve is recognized as a global rhododendron conservation hotspot. There are more than a hundred of native species including Giant Rhododendron (*R. protistum* var. *Giganteum*).



16) *Camellia reticulata*- Native in Yunnan, *Camellia reticulata* has been traditionally domesticated by local people for over a thousand of years. Many horticultural cultivars can be found from botanic garden all over the world. It is also widely cultivated as agroforestry model in local landscape for high valuable edible oil for local and international markets.



World Agroforestry Centre, ICRAF-China Program
Centre for Mountain Ecosystem Studies
Kunming Institute of Botany, Chinese Academy of Sciences

