ESTABLISHING A FOREST RESTORATION RESEARCH UNIT FOR BIODIVERSITY RECOVERY AND MITIGATING CLIMATE CHANGE IN CHINA

CHINA IMPLEMENTATION PLAN

PROJECT DURATION
APRIL 2009 TO MARCH 2014

WORLD AGROFORESTRY CENTRE
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ESTABLISHING A FOREST RESTORATION RESEARCH UNIT FOR BIODIVERSITY RECOVERY AND MITIGATING CLIMATE CHANGE IN CHINA

Project Leading Organization:
World Agroforestry Centre (ICRAF) China
Yunnan Forest Restoration Research Unit (FORRU-China)

Project Period：5 years,

1．Background and justification

1.1 Rationale

In the past, tree plantations were considered to be the best way to solve the problems of deforestation and ecosystem degradation. Thus, tree plantations were one of the main approaches for ecosystem re-construction in China. Forest plantations in China first became established on a large scale in China in the 1950s, following the Soviet and German models of forest management and forestry research, education, which concentrated on production systems yielding high and sustainable timber harvests. Forest cover increased from 8.6% to 16.5% in 50 years, resulting in greatly increased timber production as the forest area was extended. Now, China has one of the largest areas of planted forest of any country in the world. However, degeneration of ecosystems and the environment has not been halted and has become a serious problem in several places.

Large scale establishment of single-species (monoculture) tree plantations has resulted in *"Green Deserts"* with uniform forest structure, poor ecological functioning and increased biodiversity degradation. Introduced exotic species have competed with indigenous flora, outbreaks of insect pests have grown worse and wildfires are occurring more frequently. Poplar, acacia and elm were the main species planted in the north and large areas of forest are dominated by pine and fir in the south.

Ignorance of the use of traditional knowledge has also contributed to forest degradation and loss. Strict regulations from the State Forestry Administration on plantation planning limited the use of indigenous species in areas with rich biodiversity. The regulations were poorly formulated due to a lack of knowledge about and technology to grow indigenous forest tree species.

Another problem was that the value of biodiversity and ecosystem integrity has not been given sufficient attention. The Chinese government ratified the Convention of Biological Diversity in January 1993. In 1998, serious floods along the Yangtze, Songhuajiang and Nenjiang Rivers killed 4,150 people, demolished 6.85 million houses and damaged 22.3 million hectares of farmland.

.This disaster focused the attention of the government on forestry issues. Consequently, 6 large programmes were planned, including the Natural Forest Protection Program, Sloping Lands Conversion Project, Natural Reserve Establishing etc. Since then, the general public and institutions have begun to pay more attention to conservation of biodiversity and ecosystems.

Another contributing factor to forest mismanagement has been a lack of research and knowledge on forest restoration, especially systematic research on biodiversity restoration and forest ecology. Research in forestry colleges and institutions has tended to concentrate on high yielding species and high production. This situation changed at the end of 20 century, when the national forestry policy was progressively developed on forest management, requiring special management and operation of different kinds of forest. However, even today China still lacks a systematic approach to research on forest ecosystems.

In 2006, the Forest Tenure Reform Policy began to decentralize forest operations and management, transferring benefits from and rights to forest resources to households. Farmers were encouraged to initiate local management of forests by the policy but sufficient training and capacity building to enable villagers to successfully manage forests are still needed.

Consequently, systematic research, training and capacity building for technicians and local people, as well as courses in colleges on forest restoration are urgently needed for more efficient forest management for biodiversity conservation and environmental protection in China.

1.2 Forest Restoration Research Unit - Yunnan

In collaboration with the Yunnan Forest Vocational School and Gaoligongshan Nature Reserve, the World Agroforestry Centre (ICRAF-China) first began some forest restoration research in Southwest China, in 2005. This project was supported by the UK Government's Darwin Initiative under the regional initiative entitled "Facilitating Forest Restoration for Biodiversity Recovery in Indochina". Technical support and capacity building was provided by the Forest Restoration Research Unit, Chiang Mai University. During the 3-year project we initiated research in Gaoligongshan Nature Reserve on the phenology of flowering and fruiting, and seed germination experiments on more than 100 species of indigenous forest trees. Fifty-six tree species were grown in a nursery and a small herbarium and experimental field plots established. A local forest restoration curriculum was developed at the college and a national workshop held, as well as other capacity building activities. The impact of the project has been considerable, at both local and national policy levels.

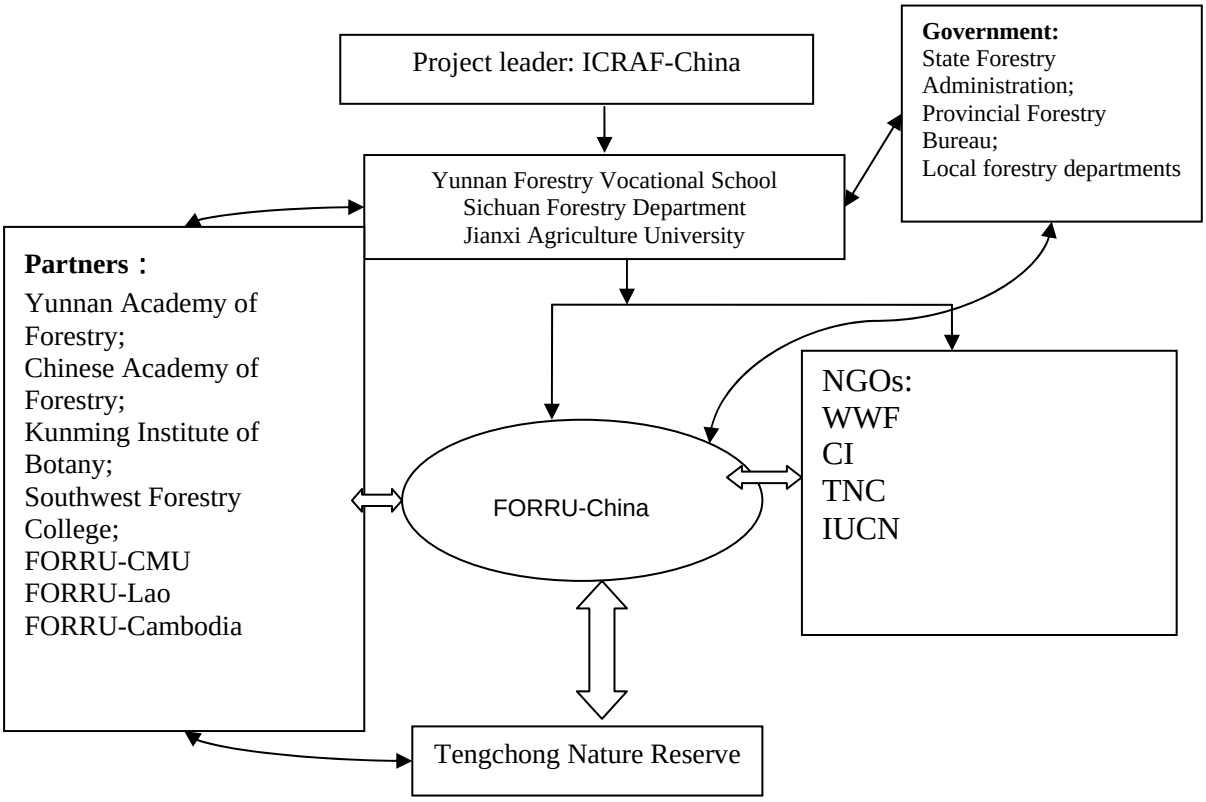
At present, the Chinese government is implementing two large-scale, nation-wide rehabilitation programs, the Sloping Lands Conversion Program and The National Forest Protection Program. Meanwhile, the large areas of forest damaged as a result of snowstorms in the South of China has prompted increased recognition of the measures to mitigate the effects of climate change. At the policy level, the government has expressed great interest in developing a suitable approach to tree species selection and reforestation methods for national projects to address biodiversity loss and climate change. This policy context creates a need to scale up our research activities.

In 2007, the China Forest Restoration Research Unit (FORRU-China) was established with a joint effort by various institutions. It is under the administration of the World Agroforestry Centre - ICRAF China. The Centre also acts as the scientific body of FORRU-China. The Yunnan Vocational School serves as the educational body, while Gaoligongshan and Tengchong Nature Reserve provides a tree nursery and a field research site. This combination strengthened links between research and higher education, between research and policy-making and between theory and

practice. Meanwhile, the Unit is linking with the Yunnan Academy of Forestry, the Chinese Academy of Forestry, Kunming Institute of Botany and the Southwest Forestry College to enhance science and forest restoration research. Government organizations, such as the State Forestry Administration, Yunnan Forest Bureau and local forest departments will also be partners of the Unit. Other NGOs and international organization also will be involved (see the organizational structure below). Also, the Sichuan Forest Department and Jianxi Agriculture University will act as key partners. To network regionally, the Unit will also work closely with similar FORRUs in Chiang Mai (Thailand), Laos and Cambodia.

The new project proposed here will build upon previous work of FORRU-China to focus on three Provinces, namely Yunnan, Sichuan and Jianxi. In Yunnan, where a global biodiversity hotspot is located, we will continue to use Gaoligongshan Nature Reserve as a research training centre, to expand our activities and introduce the FORRU methods. In Sichuan province, activities will focus on enhancing the connectivity of panda habitat and forest corridor development. In Jianxi province, which was severely affected by the 2008 snowstorms, restoring sub-tropical forest for mitigating climate change will be emphasized.

Overall, Yunnan will serve as a training centre for transferring skills and proven technologies to the other two provinces and key forestry stakeholders, enabling them to develop their own versions of the framework species techniques for forest restoration, which accelerates biodiversity recovery in degraded areas and damaged forest areas, and has been successfully demonstrated in Doi Suthep National Park in northern Thailand. Demonstration sites established at these three project sites will also provide examples to build capacity among policy makers and forestry agencies enabling them to design appropriate forest restoration programs for biodiversity recovery and climate change mitigation.



Organizational Structure

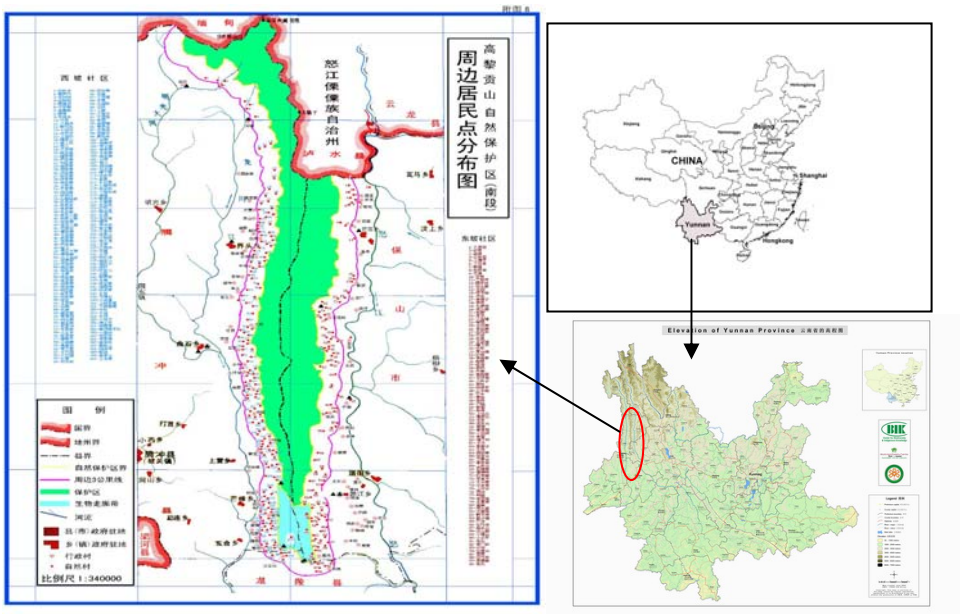
Field Research Site

The project will still work at Tengchong Nature Reserve as the field research site. The Gaoligongshan Natural Reserve in Tengchong County, Baoshan prefecture located in west Yunnan, 700km to Kunming.

Reasons of selecting this site:

- Gaoligongshan National Natural Reserve is one of the places which has the richest biodiversity in China and is also one of the biodiversity hotspots and core areas identified by IUCN and CITES.
- Gaoligongshan Mountain is located in the important area on the southern border of the Himalayas a biological corridor connecting many natural reserves in southwest Yunnan.
- The forest type here is subtropical broadleaf forest; research on this habitat could guide the forest restoration work in other areas in south China.
- The Gaoligongshan Natural Reserve Management Bureau has a steady and efficient team, which has received good training and is dedicated to forest restoration.
- The project site is located on the edge of the Natural Reserve so the results of forest restoration research would serve as a demonstration to biodiversity protection and habitat creation for wildlife.

Map1: Location of Tengchong Gaoligongshan Nature Reserve



2．Project objectives and outputs

2.1 Overall Objectives

The overall objective is to promote the capacity of FORRU-China to carry out research, education, training and capacity building to facilitate restoration of forest ecosystems in China for biodiversity conservation and environmental protection (including climate change mitigation)..

2.2 Specific objectives

- Promote the capacity FORRU-China.
- Continue to develop courses on forest restoration at Yunnan Forestry Vocational School and combine them with research practices.
- Develop forest restoration research at the Tengchong project sites and promote its sustainability.
- Extend and disseminate research results on forest restoration to other provinces, particularly Jianxi and Sichuan.

2.3 Project outputs, anticipated impact and their measurement

- Research outputs: at least one paper published in national or international journals every year.
- Educational outputs: arrange courses and practicals on forest restoration for students in the college, give training to staff of forestry departments.
- Capacity building: to enable the research team to undertake research on forest restoration independently.
- Publications etc: a book entitled “Research on Forest Restoration on Gaoligongshan Mountain” would be published at the end of the project.

3. Project activities

In collaboration with Tengchong Nature Reserve and Yunnan Forestry Vocational School, the World Agroforestry Centre would design the Implementation Plan in the first year to expand the research initiated under the Forest Restoration project which was previously funded by the Darwin Initiative. The main activities planned are based on four components: field research, school education, capacity building and outreach.

3.1 Field Research

Field Research will be continued in Tengchong Nature Reserve for framework species selection. Activities include:

- *Phenology*: the Phenology trails will be continued to observe and monitor potential framework species.
- Nursery Research: nursery research related to seeds treatment, propagation and seedling germination will be continued. Another 40 tree species will be introduced into the research programme
- Field trails: monitoring of the performance of 32 planted species will be carried out. Also, a large scale plantation with selected species is planned.
- Field data bases: the herbarium and field data bases will be further improved.

3.2 College education

- *Curriculum*: development was based on the translated book “How to Plant a Forest”. The new translation of “Research For Restoring Tropical Forest Ecosystems” will

be further integrated into the curriculum in Yunnan Forestry Vocational School.

- *Practical work and thesis writing*: the School will continue to use Tengchong Nature Reserve as the research base for their graduate for thesis writing and practical research.

3.3 Capacity Building

- *Farmer training*: farmers' participation is planned for large scale plantations and on-farm research of endemic, economic and endangered tree species. The project will use the field manual which was developed in 2007/08 for the farmer training.
- *Forester training*: Currently, the State Forestry Administration is approaching us for potential training for foresters in China to introduce the concept of Framework Species

3.4 Outreach

The implementation plan will require several different strategies to scale up the project activities and impact. Forester training is one of the strategies. To expand the programme into Sichuan and Jiangxi provinces, we are developing a research programme in sub-tropical and temperate forest zones. In addition, the proposed publication(s) will be support outreach programmes. Also, the outreach will be achieved through National and International symposium on Forest Restoration.

4. Timeframe

The table below presents the implementation plan and timeframe of the proposed activities:

Activities	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year5**
FIELD RESEARCH					
Phenology	■	■	■		
Nursery Research	■	■	■	■	■
Field trails	■	■	■	■	■
Field database	■	■	■	■	■
COLLEGE EDUCATION					
Curriculum	■	■	■	■	■
Practical work and thesis		■		■	
CAPACITY BUILDING					
Farmer training		■	■	■	
Forester training	■	■	■		
OUTREACH					
Publication			■	■	■
Workshop			■		■

5. Project beneficiaries

- Organisations and people related to project implementation, including: staff from FORRU-China, teachers and students from Yunnan Forestry Technological College, staff from Gaoligongshan Natural Reserve Management Bureau, technicians from Tengchong Forestry Bureau and communities around project plantations.
- Forestry technicians from provincial, municipal and local level forestry departments will also receive training on forest restoration.
- Organizations and individuals from all over the world could share information with us and the project research base could be supplied if required.
- Member of the public could gain knowledge on biodiversity and forest restoration.

6. Project sustainability

The China-FORRU will have a capable and efficient research team to continue the teaching, research and training work on forest restoration after the 5 year implementation period of this project.

7. Project proponents and project team

Xu Jian chu, Project Leader, ICRAF-China

He Jun, Project Coordinator, ICRAF-China

WuXunfeng: Head of the educational aspects of the project, Yunnan Forestry Vocational School.

ZhouYuan: Expert on forestry policy and forestry economics.

LiuYingjie: Director of the Technological Department in Yunnan Forestry Technological College.

SunWei : Director of the Forestry Section in Yunnan Forestry Technological College.

WangYali: Professor of Forestry.

ShengJiashu: Plant classification, sample collection and processing.

Jianghouqiong: Seed collection, treatment and nursery production.

XuTaiyuan: Expert on plant bionomics.

ChenYou: Expert on forest protection.

LiQing: Forest phenology.

WangYan: Office secretary

Two researchers will be hired at the start of the project.

8. Proposed Budget

	Detail	Amount (USD)		
		Total	Project fund	Domestic matching Fund
Staff salaries and insurance	Total	66000	44400	21600
	Full time: 5 persons, 500USD/Person/Month, 5 years.	30000	30000	
	Part time: 6 persons, 200USD/person/month	36000	14400	21600
Training, staff development	Total	90000	90000	
	Accommodation, transportation and training fees for 15 persons , 1000USD each.	15000	15000	
	Training for local forestry department, 5000 per year.	25000	25000	
	40 students' practice in Tengchong, 10000 USD per year.	50000	50000	
Construction and maintenance of buildings	Total	75000	55000	20000
	Training room, 100m^2, office and demonstration room 150m^2	70000	50000	20000
	Office renting	5000	5000	
Office and communications	Operation fees of Yunnan FORRU and Tengchong Gaoligongshan management bureau, 2000USD per year.	25000	20000	5000
	FORRU-China	12500	10000	2500
	Tengchong Gaoligong management bureau	12500	10000	2500
Materials – Nursery and Field plots		40000	40000	
Equipment	Total	64350	64350	
	FORRU-China	15000	15000	
	One jeep	22000	22000	
	Tengchong Gaoligongshan management bureau	12350	12350	
	Research centre	15000	15000	
Transport	Researchers' transportation between Kunming and Tengchong and cost of cars.	45000	45000	
	Staff transportation between Kunming and Tengchong	30000	30000	
	Car costs in Kunming	7500	7500	
	Car costs in Tengchong	7500	7500	
Plot establishment – planting and maintenance materials and casual labour	Total	30000	30000	
Conferences, workshops etc.	Total	30000	30000	
	Mid-term conference	10000	10000	
	Attending overseas conferences, 4	20000	20000	

	people every year, 1000 USD per person.			
Printing and information dissemination	Total	25000	25000	
	Dissemination and public education	10000	10000	
	Two books' published	15000	15000	
Overheads	5% of total fund		22187.5	
Total		512537.5	465937.5	46600