Asia-Pacific Network for Sustainable Forest Management and Rehabilitation

PROJECT DOCUMENT

[Demonstration on Sustainable Forest Management and Restoration in Hilly and Low Mountain Area of Southern China (2016P2-CAF)]

[Chinese Academy of Forestry]

[2017.01-2020.12, 48months]

Basic Information

Project title(ID)	Demonstration on Sustainable Forest Management and Restoration in Hilly and Low Mountain Area of Southern China (2016P2-CAF)
Executing agency	Research Institute of Forestry, Chinese Academy of Forestry
Implementation agency(ies)	Forestry Department of Anhui Province, P. R. China through Qinyang Forestry Bureau, and Forestry Department of Zhejiang Province, P. R. China through Lin'an Forestry Bureau
Project Director: (name and title) Jiang Chunqian, director/Professor Tel 86-10-62889093…Email…jiangchq@caf.ac.cn…Fax …86-10-62888345	
Target area(s) (project locations and context) Qingyang County of Anhui Province and Lin'an County of Zhejiang Province, both of which are located in hilly areas of Southern China.	
Project implementation duration: [Jan. 1, 2017 – Dec. 30, 2020, 48 months in total]	
Total budget(USD)	1,410,207
APFNet grant(USD)	695,207
Conouterpart contribution (USD) (list other funding souces and amounts, specify cash and in-kind constribution)	715,000(in cash and in-kind)

Project description

1. Existing Problems

Forest plays a significant role in tackling climate change and developing low carbon economy. It is also the main carrier of ecological civilization development. According to the 8th National Forest Resource Inventory, the total area and volume of China's forest resources are both growing, but they are far below the world's average level and the quality also is low. The per capita area is only 1/4 the world's average and the per capita volume is only 1/7. Hilly areas of Southern China enjoy favorable humid and thermal conditions and therefore great potential in productivity, which enables them to play an important part in forest quality enhancement and forest zone development in China. However, some places have been witnessing serious forest degradation and are in urgent need of improving forest management.

Forest resources in Qingyang County of Anhui Province and Lin'an County of Zhejiang Province are very typical in hilly areas of Southern China. Forestry holds an emphasized position in construction of national economy and ecological civilization in the two places. And they represent typically different economic development areas in Southern China. Zhejiang Province is situated along the southeast coast. It has comparatively developed economy and people there enjoy comparatively high living standards, which makes it have already reached the level of moderately developed countries. However, Lin'an County, situated in the northwest of Zhejiang Province and densely populated, has a limited environmental capacity and thus its resources and the environment has weak carrying capacities. Its pursuit of economic growth has led to wide range forest degradation and obviously increased greenhouse gas emission, which has backfired as a bottleneck impeding sustainable economic and social development and life quality improvement. Anhui Province is situated in the hinterland of the Yangtze River Delta. In Qingyang County, hills cover more of the area while waters cover a smaller area. The county is one of the key typical collective forestry zones in Southern China, but given the ecological red line, it still faces challenges of barren soil and low forest coverage (less than 0.3) in some local areas in forest restoration. Under different models of forest resource management, both Qinagyang County of Anhui Province and Lin'an County of Zhejiang Province still face severe challenges in how to rehabilitate degraded forests, improve sustainable forest management and find a solution to low forest quality by policy and technological means.

In addition, China has initiated National Carbon Trade Programme since 2017, aiming to motivate forest potential in carbon sink and economic efficiency through forest restoration and management activities. The two places lack enough understanding about the importance of carbon sink and the accounting methods in forest restoration and management, which will hinder the locals' right to benefit from future carbon trade market. APFNet gives prioritized supports to promoting forest restoration and forest quality in Asia-Pacific areas and therefore improving forest capacities to address climate change through enhanced sustainable forest management. The project meets not only the forestry development appeals of Qinagyang County and Lin'an County, but also APFNet's strategic target by conducting research on degraded forest restoration, to explore and promote the local forest productivity, increase carbon sink,

raise living standards of local people in forest zones, and improve the technical system and management models of capacity building of forest restoration.

2. Goal(s) and objectives

The general objective of project is to promote restoration and sustainable management of forest which focus on the improvement of forest ecosystem productivity and forest carbon storage in hilly and low mountain area of Southern China. It is anticipated to bring forward forest restoration technologies and models. The results are expected to enhance both technological and management capacities of hilly and low mountain areas of Southern China in sustainable forest management and restoration, improve the quality of forest, increase forest carbon storage, improve living standards of local residents in the forest zone and thus set an example for its kind in the Asia-Pacific region in future. The objectives are as follows:

(1) Developing and demonstrating effective technological methods and strategies on sustainable management and restoration of forest at landscape level;

(2) Establishing the carbon accounting methodology for SFM and restoration at the project level; and

(3) Promoting knowledge and experience exchange in SFM and restoration among Asian-Pacific region.

3. Expected outputs and key activities

Output 1 Demonstration on Sustainable Management and Restoration of Forest

Activity 1.1 Set up sample plots and controls

Activity 1.2 Surveying background data in project sites

Activity 1.3 Designing operation plans on forest restoration and management for demonstration sites

Activity 1.4 Implementing the operation design plan

Activity 1.5 Developing strategies of SFM and restoration

Activity 1.6 Monitoring and evaluating the effect of restoration

Output 2 Accounted Forest Carbon Storage and Sinks in Target Areas

Activity 2.1 Analysing baseline data of carbon pools of project sites

Activity 2.2 Making dynamic study on forest carbon storage in target areas

Activity 2.3 Establishing FRLs and accounting of carbon sinks at project sites

Activity 2.4 Developing the carbon accounting methodology at project level which could be applied in the subtropical forest area of Southeast Asia.

Output 3 Enhanced Capacity Building and Information Sharing among the Stakeholders

Activity 3.1 Holding project inception workshop and 1st steering committee for program implementation

Activity 3.2 Building capacity via training on relevant knowledge and techniques

Activity 3.3 Exchanging regularly and attending international conferences

Activity 3.4 Publishing project results

4. Targets & Benefiters

(1) Governmental agencies: Qingyang County Forestry Bureau, Lin'an County Forestry Bureau of Zhejiang Province;

(2) Youhua State-Owned Forest Farm of Qingyang County, Anhui Province, Anhui Academy of Forestry, Lin'an Forestry Modern Science and Technology Service Centre of Zhejiang Province, Zhejiang A&F University, and Chinese Academy of Forestry;

(3) Forest farmers and villagers in target areas and the neighbourhood;

(4) Other relevant enterprises/companies in project sites.

5. Project Approaches

(1) Combine PRA and Expert consultations. The project will analyze forest degradation types and relevant policies, and finish the needs assessment of all stakeholders, by combining the PRA (Participatory Rural Appraisal) method and expert consultation approach at landscape level. PRA could obtain needs of information about technique and policy, and expert consultation approach may ensure procedure and results of analysis are scientific and reliable.

(2) Training courses and study tours for capacity building. EA should invite outstanding experts to provide classroom teaching and field practice in order to improve the capacity building of stakeholders in project area.

(3) Field investigation. Estimating carbon storage and sinks concerning SFM and restoration through field investigation.

(4) Demonstrating the best practices. Rehabilitate the productivity of main plantation systems and increase forest farmers' income by demonstrating the best practices and skills training of sustainable management and restoration of forest.

(5) International communication. To disseminate the achievements by attending international conferences and learn the advanced ideas by visits.

6. Safeguards

This project will be executed in full compliance with APFNet project management rules so as to guarantee its smooth operation. It is an important part of research contents in the field of tackling climate change and sustainable forest management. It is also one of the key research fields supported by the government. Forestry is one of important approachs to tackling climate change, developing low carbon economy and promoting ecological civilization construction. Therefore, the national policy and APFNet rules provide policy guarantees for smooth operation of this project.

Chinese Academy of Forestry is the execution agency of this project. It is the national level forestry

scientific research institute of China. It has expert teams with international vision and good expertise in sustainable forest management and restoration, forestry carbon accounting and monitoring, which provides technical guarantee for smooth implementation of this project.

The conditions as stated above provide all-dimensional guarantee for smooth implementation of this project.

Abbreviations and acronyms

Center for International Forestry Research **(CIFOR)**
Chinese Academy of Forestry **(CAF)**
Diameter at breast height (**DBH**)
Executing Agency **(EA)**
Food and Agriculture Organization of the United Nations **(FAO)**
Forest Reference levels **(FRLs)**
Implementation Agency **(IA)**
Intergovernmental Panel on Climate Change **(IPCC)**
International Development Research Centre **(IDRC)**
International Model Forest Network **(IMFN)**
Lin'an County Forestry Bureau **(Lin'an FB)**
Lin'an County Modern Forestry Science and Technology Service Center （**Lin'an MFSTC**）
Non-timber Forest Products **(NTFPs)**
Project Management Office （**PMO**）
Project Steering Committee **(PSC)**
Qingyang County Forestry Bureau **(Qingyang FB)**
Reducing Emissions from Deforestation and Forest Degradation **(REDD)**
Research Institute of Forestry **(RIF)**
Site Project Management Office （**SPMO**）
Sustainable Forest Management **(SFM)**
United Nations Forum on Forests **(UNFF)**
United Nations Framework Convention on Climate Change **(UNFCCC)**

Contents

Project details

1. Background and Rationale

1.1 Contexts and Problems

Forest is the principal part of the terrestrial ecosystem. It plays an irreplaceable role in addressing climate change and developing low carbon economy. According to the 8th National Forest Resource Inventory (2013), the forest area and volume are both growing in China. The forest area has increased from 195 million hectares to 208 million hectares, the forest coverage rate, from 20.36% to 21.63%, and the forest volume, from 13.721 billion m³ to15.137 billion m³, with a net increase of 1.416 billion m³. However, forest coverage in China is much lower than the world's average of 31%, the forest area per capita is only 1/4 the world average, and the forest volume per capita is merely 1/7.

Hilly and low mountain areas of Southern China enjoy favorable humid and thermal conditions and therefore great potential in productivity. However, one universal question facing on sustainable forest management is how to reduce forest degradation, and enhance capacities in forest management and carbon sequestration potential from perspectives of technology and policy by taking the resource superiority and hydrothermal conditions.

Qingyang County and Lin'an County (Map and detailed information in Annex A) represent different economic development levels of key forest zones in hilly areas of Southern China. Forestry holds an emphasized position in construction of national economy and ecological civilization in two Counties. Lin'an County, situated in the northwest of Zhejiang Province and densely populated, has a limited environmental capacity and thus its resources and the environment have weak carrying capacities. Its pursuit of economic growth has led to wide range forest degradation and obviously increased greenhouse gas emission, which has backfired as a bottleneck impeding sustainable economic and social development and living quality. For Qingyang County of Anhui Province, hills cover more of the area while waters cover a smaller area. The county is one of the key typical collective forestry zones in Southern China, but given the ecological red line, it still faces challenges of barren soil and low forest coverage (less than 0.3) in some areas. The two counties still face severe challenges in how to rehabilitate degraded forests, improve sustainable forest management and find a solution to improve low forest quality by policy and technological means.

In addition, China has initiated National Carbon Trade Program since 2017. Lack of guidance and methodology in determining forest reference levels affects carbon sink accounting. Determination of forest reference levels is prerequisite to research on carbon sink. So, how to

determine forest reference levels is the precondition of carbon sink accounting, and scientific basis for carbon sink trade. The two places lack enough understanding about carbon sink and the accounting methods in forest restoration and management, which will hinder the locals' right to benefit from future carbon trade market. The stakeholders in Lin'an and Qingyang urgently need knowledge and skills in the field of carbon sink.

Thus, it is a wise choice for Qinagyang County and Lin'an County to raise the productivity of local forest, increase carbon sink, improve living standards of local people in the forest zone and intensify capacity building of forest restoration through conducting study on degraded forest restoration, demonstrating sustainable forest management, and promoting capacity building activities.

1.2 Targets & Benefiters

(1) Governmental agencies: Qingyang County Forestry Bureau, Lin'an County Forestry Bureau of Zhejiang Province;

(2) Youhua State-Owned Forest Farm of Qingyang County, Anhui Province, Anhui Academy of Forestry, Lin'an Forestry Modern Science and Technology Service Centre of Zhejiang Province, Zhejiang A&F University, and Chinese Academy of Forestry;

(3) Forest farmers and villagers in target areas and the neighborhood;

(4) Other relevant enterprises/companies in project sites.

1.3 Project relevance to APFNet priorities, objectives, mission and vision

The project focuses on how to effectively rehabilitate degraded forest in hilly areas of Southern China and enhance capacity building of sustainable forest management. The results are expected to enhance both technological and management capacities of stakeholders in sustainable forest management and restoration, improve the quality of forest, increase forest carbon storage, improve living standards of local residents in the forest zone and thus set an example for its kind in the Asia-Pacific region in future. Therefore, the proposed project is in line with the objectives, mission and vision, and is closely relevant to the key priority of APFNet's projects.

1.4 Project methodology and approaches

(1) Combine PRA and Expert consultations. The project will analyze forest degradation types and relevant policies, and finish the needs assessment of all stakeholders, by combining the PRA (Participatory Rural Appraisal) method and expert consultation approach at landscape level. PRA

could obtain needs of information about technique and policy, and expert consultation approach may ensure procedure and results of analysis are scientific and reliable.

(2) Training courses and study tours for capacity building. EA should invite outstanding experts to provide classroom teaching and field practice in order to improve the capacity building of stakeholders in project area.

(3) Field investigation. Estimating carbon storage and sinks concerning SFM and restoration through field investigation.

(4) Demonstrating the best practices. Rehabilitate the productivity of main plantation systems and increase forest farmers' income by demonstrating the best practices and skills training of sustainable management and restoration of forest.

(5) International communication. To disseminate the achievements by attending international conferences and learn the advanced ideas by visits.

2. Goal(s) and Objectives

The general objective of project is to promote restoration and sustainable management of forest which focus on the improvement of forest ecosystem productivity and forest carbon storage in hilly and low mountain area of Southern China. It is anticipated to bring forward forest restoration technologies and organizational management models. The results are expected to enhance both technological and management capacities of hilly areas of Southern China in SFM and restoration, improve the quality of forest, increase forest carbon storage, improve living standards of local residents in the forest zone and thus set an example for its kind in the Asia-Pacific region in future.

The objectives are as follows:
(1) Testing and demonstrating effective technological methods on SFM and restoration ;
(2) Establishing carbon sink accounting methodology for SFM and restoration at the project level; and
(3) Promoting knowledge and experience exchange in SFM and restoration among Asian-Pacific region.

3. Outputs and Activities

♦ Output 1 Demonstration on SFM and Restoration

Activity 1.1 Set up sample plots and controls

PMO is responsible for inviting 2 forest inventory experts to train 5 persons according to technical rules.

Integrated field visit with statistical data （for example yearbook）, referring to topographic maps, remote sensing images and other materials, SPMO will choose and set up fixed sample plots (20m×20m). There were 3 plots in each sub-compartment.

Set up control plots in each field activity of activity 1.5 (1.5.1.1 includes 2 controls). The size of each control should be 20m×50m~100m

All the investigation activities will abide by *Annex G _Field investigation process*. The total of sample plots and controls is about 66 according to budget approval.

This activity will make a preparation for field investigation activities, construction of demonstration sites, and operational design. It will be accomplished within 3 months after project initiation.

Activity 1.2 Surveying background data in project sites

Field investigation technical process see Annex

PMO should convene a meeting on background data investigation training, including 2 experts and 10 investigators.

IAs and investigators will investigate the background data on forest resources in full compliance with technical rules (forest second /third type inventory) and other related technical guidance.

Background data in sample plots(20m×20m). Tree/arbor layer(20m×20m), shrub layer(2m×2m), herbage layer(1m×1m), litter layer(1m×1m), and soil. Detailed information form see the Annex H *Investigation form (11).*

And then develop the hierarchy of forest resources in project activity region in advance, thus, laying the cornerstone for the following carbon sink accounting in the course of forest restoration in demonstration areas.

The first background data investigation will be fulfilled within 6 months after project initiation.

Activity 1.3 Designing operation plan on forest restoration and management for demonstration sites

According to the development objective of local forest, SPMO will invite 2 consultants to make operation plan on forest management and restoration for Qingyang and Lin'an, respectively. The designed plan should be complied with the *Regulations for Forest Tending (GB/T 15781-2015)* and *Regulation for Compiling and Implementing Forest Management Plan (LY/T2007-2012)*. Meanwhile, the consultant should give a monitoring plan to help EA and IAs carry out activity 1.6.

This activity will produce optimized feasible programs going through rounds of participatory discussions by consultants and stakeholders in SFM and restoration, which include target forest sub-compartments, operation objectives, technical measures at different phases and others.

This activity will be finished in the latter half of the first year.

Activity 1.4 Implementing the operation design plan

According to the work design plan formulated in Activity 1.3, SPMO should purchase seedlings, tools and equipment and then carry out field activities（prepare, plant and maintain sites）.

The project activity area is 160 hectares, of which 60 hectares will be operated by Lin'an County and the other 100 hectares will be operated by Qingyang County according to their plans (Detailed information see Annex F). Activities include the following sub-activities：

1.4.1 Field activity in Qingyang

1.4.1.1 Degraded forest restoration in Youhua State Forest Farm.

50 hectares low efficiency forests will be restored through enclosing tending and artificial forcing regeneration methods.

1.4.1.2 Large-diameter-oriented cultivation of Chinese fir in Yaoxi Forest Farm.

15 hectares of half-mature Chinese fir forests will be managed through SFM approach in order to cultivate large-diameter Chinese fir.

1.4.1.3 Intensive management of bamboo forest.

Demonstration on multi-purpose usage of bamboo products in 20 hectares of bamboo forests.

1.4.1.4 Design planning on control of pine wilt disease and protection of migratory birds

Two designed plan should be finished. One is for pine wilt disease, and another is for protection of migratory birds.

1.4.2 Field activity in Lin'an

1.4.2.1 Landscape restoration on degraded second forest.

30 hectares degraded forest to be restored by planting *Chinese torreya*, Chinese fir and broad leaf tree.

1.4.2.2 Multi-purpose restoration and management of degraded forest land.

Upgrade 10 hectares degraded forest land into management by adopting the "*Chinese torreya* + broad leaf tree species" model.

1.4.2.3 Restoration and sustainable management of degraded Chinese fir plantation

20 hectares degraded Chinese fir plantation will be improved by planting conifer and broad leaf mixed forest.

Activity 1.5 Developing strategies of SFM and restoration

Integrated economic and policies with local needs assessment, PMO will invite consultants to develop the strategies of SFM and restoration (at least 10 years), which are in according with demand of local authority and could provide direction and suggestions for forestry development in the future. The formulate strategies/programs (draft) on improving SFM and restoration at landscape levels fit for hilly areas of Southern China. The content should contain management ability of administrative staff, the plan and approach of biological diversity protection, forest restoration and management, policy of benefiting-farmers processing and marketing on NTFP. It should satisfy common demands of local stakeholders as much as possible, and guarantee basic subsistence of forest farmers.

Besides, such programs may make explorative suggestions on encouraging local forest farmers and other stakeholders to make petty loans for promoting SFM and restoration.

PMO will invite technical experts to evaluate twice strategies (draft) of SFM and restoration, and finally optimize them into a feasible and propagable version in the Asian-Pacific region. （PMO will publish a book including guidelines manual on SFM and restoration in the last year see activity 3.4）

This activity will be carried out in the first two years

Activity 1.6 Monitoring and evaluating the effect of restoration

Detailed monitoring plan to assess the outcomes of forest restoration in technical aspects will be drafted by the consultants for Activity 1.3. PMO/RIF will take lead in conducting the monitoring plan and develop the comprehensive technical report analyzing the achievements and demonstrating the best practice of SFM and restoration in hilly area of southern China.

PMO and PSC will be responsible for the internal evaluation. They will supervise and guide the project activities and the use of funds. Before the project completing, PMO and PSC should make an assessment of project, including the effect of the project implementation, impact of the project to stakeholders, as well as the experience and lessons.

The RIF shall record and monitor the physical, technical and financial progress of the Project and identify the goods and services financed by APFNet.

APFNet will be responsible for the external evaluation.

♦ Output 2 Accounted Forest Carbon Storage and Sinks in Target Areas

Activity 2.2 could help local authority and stakeholders understand the economic and ecological benefit of carbon sink and emissions reduction, and learn how to estimate the carbon sink through the appropriate approach. Besides, the result of activity can provide a case on farmer increment from carbon sink.

Activity 2.1 Analyzing baseline data of carbon pools of project activity areas

Analyzing data will help carbon pools to be stratified and improve the accuracy and precision of the carbon accounting, and reduce the number of sample plots needed for monitoring. Based on Activity 1.2, PMO and SPMO will stratify carbon pools and find out key carbon sources. Carbon hierarchy will be classified by type, structure, age, species, and canopy density of stand. The differences of each hierarchy is minimal.

Carbon hierarchy of baseline and project scenario need to be considered, respectively. We will analyze the data via excel and SPSS, and estimate the spatial distribution pattern of carbon storage in the different carbon hierarchy of project areas under the baseline scenario and project scenario.

Activity 2.1 could not only help local authority and other stakeholders understand the economic and ecological benefit of carbon sink, but also reduce the emissions from the operation activity (transport and fertilization).

Test physicochemical property of soil and carbon content in botany. Soil samples will be 330 （5*66）; Carbon content samples will be 660(10*66).

The duration of this activity is about 40 days each year of the last 3 years.

Activity 2.2 Making dynamic study on forest carbon storage in target areas

RIF will use the biomass expansion factor method and the forest inventory method to estimate forest carbon storage changes in project areas. We will estimate the carbon sink in baseline scenario and project scenario, GHG emissions in project activity boundary, leakage, and reduction emissions.

And we are to analyze leakage risks in the course of implementation.

In order to understand the dynamic change of forest management and restoration and make carbon sink accounting in project sites, it is necessary to regularly monitor data of the forest ecosystem, at least once a year generally.

Regularly monitoring: aboveground carbon pools (tree increment, the change of shrub, and herbaceous layer); soil carbon, it will be estimated twice, the one is after the sample plots could be set up, and the other are planned to account the last quarter of project implementation. Besides, we need to monitor the carbon change result from forest tending activities.

At the end, we will evaluate potential ecological and social benefits for project areas according to the carbon change and develop the technical report.

This activity will be initiated at an appropriate time between the second year and the fourth year after project initiation, the duration of which will be 4~6 months generally.

Detailed information see Annex I_ *Investigation form (11)*

Activity 2.3 Making FRLs and accounting of carbon sinks in project areas

FRL is the benchmark which could help to assess the effect and achievements of the carbon sink in project sites. And until now, there is no FRL to be established.

Integrating Activities1.2, and 2.2, and natural disturbance and logging, PMO and SPMO should find FRLs at the project level, analyze and calculate forest carbon sinks of project areas, and make uncertainty analysis on the calculation results.

This activity is arranged to fulfill in the third and fourth years after project initiation, generally by the project office and project sites in the third quarter of the third year.

Activity 2.4 Developing the carbon accounting methodology fit for the hilly area of Southern China at project level

Based on Activities 2.2 and 2.3, following principles and theories in the *IPCC Guidelines*, the *Carbon Sink Forestation Project Methodology* and the *Forest Management Carbon Sink Project Methodology*, PMO will develop FRLs fit for carbon sink estimation at project level, with the help of expert steering committee. In order to develop the complete carbon accounting methodology, the expert steering committee should consist of experts at least from forest ecology and forestry economics and it is convened at least three times generally.

The carbon accounting methodology could guide people how to estimate the carbon sink in practice at project level, and we will share the application experience with other people from the world through international conference and communication. （Please refer to the Annex B, activities 3.3 and 3.4 for the detailed information）.

This activity is arranged to carry out in the first half of the fourth years after project initiation.

♦ **Output 3 Enhanced Capacity Building and Information Sharing among the Stakeholders**

Activity 3.1 Holding project initiation meetings and 1ˢᵗ expert steering committee for program implementation

PMO, SPMO and local administrative offices will hold the project initiation meeting (include signing project cooperation agreements), and project steering committee which may discuss the details of project implementation plan in order to guarantee smooth accomplishment.

There will be about 50 people to participate in a meeting, including 6 experts in PSC, 6 from PMO and RIF, 15~20 from Anhui forestry Administration, Chizhou Forestry bureau and Qingyang Forestry Bureau, 20 from Zhejiang Forestry Administration and Lin'an Forestry Bureau.

PMO will invite the project officers from APFNet to attend the initiation meeting and report the administrative rules of APFNet project, including the use of funds.

After initiation meeting, PMO and SPMO should purchase office equipment (vehicle computer, camera, printer and scanner, and others). Purchasing information will be found Annex E-2 *Budget by category - Procurement.*

This activity should be finished in the first two months of the project.

Activity 3.2 Building capacity via training on relevant knowledge and technique

According to the above needs assessment, capacity building includes training basic theories, technologies and methods on SFM and forest restoration.

(1) Basic theories on SFM and forest restoration landscape level. 60 trainees, 2 experts.

(2) Field investigation and forest management technique and methods (including pests' control). 60~100 trainees, 2 experts.

(3) Economic forest cultivation technique (including Winer bamboo shoots). 100~150 trainees, 2 experts.

(4) Basic theories and knowledge of carbon sink and carbon accounting methods.

The training method may include classroom and field course (field visit each other between two counties), and also go abroad learning advanced technologies and experience. PMO is responsible for inviting technical experts to train stakeholders/trainees in the project sites, drawing up a training plan, and also preparing materials and manuals. The general objective of the total number of target population is 400 through the whole project.

Training classes to be finished within the first year after project initiation mainly include basic theories and technologies in SFM and restoration, drivers of degradation investigation and analysis, methods of forest background data survey, and plant diseases and pests prevention and control technologies.

Training classes in the second year after project initiation are primarily on basic theories and knowledge of carbon sink and carbon accounting methods, and the technologies on carbon sequestration capacity enhancement. 80~120 trainees, 2 experts.

Activity 3.3 Exchanging regularly and attending international conferences

Regularly exchanging project progress.

PMO and PSC should convene the interim project progress workshop which is mainly for assessing previous project research outcomes and working on detailed plans and programs for the next step in order to guarantee the project completed in compliance with quality requirements and the time limit. This activity will be in accordance with monitoring and evaluation activity (activity 1.6).

Taking part in international exchange and disseminate project achievements.

Organize technique whole show and key participants of the project to go abroad (Southeast Asia) for 7 days to learn and participate the experience and lessons, which does not exceed seven person-times. Detailed budget see the annex E_*Project Budget_International communication form*.

RIF will attend international academic conferences for four person-times, such as the UNFCCC for one person-time and the UNFF for one person-time or other workshops, exchanging project experience and achievements, with international peers and facilitating project operation and promotion, including the FRLs and carbon accounting methodology at project level. Detailed budget see annex E_*Project Budget_International communication form*.

(1) UNFCCC/UNFF, USA. December, 2019. New York. To discuss technical regulations to establish the FRLs.

(2) Southeast Asia (Thailand)/ Canadian Forest Service (IMFN). March, 2020. Regional model forest workshop. To report achievements of the project and share the experience of SFM and forest restoration with IMFN.

Activity 3.4 Publishing project results

PMO and SPMO are responsible for summarizing and compiling project research achievements and experience （including strategy in activity 1.5） for publication by presses including the achievement and experience on SFM, forest restoration and carbon accounting.

At the same time, attending international workshop to share the project achievements and experience to the international community (activity 3.3).

This activity is carried out in line with project management rules, and publication of achievements will be completed in the second half of the year of project conclusion.

4. Risks and Assumptions

Project design and operation is based on necessary supports provided by APFNet, the project management office and government agencies in project sites, and project team members having good expertise and knowledge and able to obtain project data and result assumptions according to operation programs. Such basis guarantees smooth operation of the project and successful acquisition of anticipated results.

4.1 Policy Risk

This project is consistent with such policies in the country's climate change, low carbon development, ecological civilization construction and forestry. It is one of the key projects supported by the government. There exists no policy risk.

4.2 Technical Risk

Project areas have a long history of forest management. Project participants have rich experience and good management skills. Relevant scientific research faculties of Zhejiang A&F University, Anhui Academy of Forestry and Anhui Agricultural University serve as technical advisory experts provide intellectual and technical supports for project operation. Besides, Chinese Academy of Forestry is a national forestry scientific research institution with outstanding forestry experts in it. Particularly, experts in its Forest Sustainable Development Center provide technical supports for this project. They have accumulated plenty of experience in long time scientific research cooperation and practice and mastered technologies in sustainable forest management and restoration. Thus, the technical risk is low.

4.3 Disaster Risk

Hilly Areas of Southern China have a wide coverage of red earth which makes it vulnerable to loss of water and soil. So, precautions should be worked out in project work design. Forestry disasters happen frequently in hilly areas of Southern China, especially, there are many Buddhism temples in Qingyang County. Hence, preventions should be taken against forest fires. Besides, plant diseases and pests constitute another challenge to forest management. In the course of project operation, the method of "Prevention prioritized while combined with control" must be adopted for effective prevention. Once large scale disasters happen, it probably destroys the project. This is crucial to smooth completion of this project.

4.4 Market Risk

Shortage in supply of forest products will still be as it is for a long time, especially forest tourism and *Chinese torreya* products which are in high demand but short of supply in the market. It is

forecast that market supply and demand is not subject to dramatic change in next 10 to 20 years. Thus, the market risk of this project is low.

5. Institutional Management and Communication

5.1 Organizational Structure

The information on project organizational structure, please see Annex C-1.

5.2 Project steering committee

Project steering committee (PSC) will be established. PSC will be consist of the technical personnel who is from the RIF, Anhui Forestry Department and Zhejiang Forestry Department.

PSC should make sure the project implementation smooth through reviewing the AWP and monitoring the activities. Besides, project will hold progress workshop regularly, and PSC be invited to attend the workshop to communication with project team.

PSC Members

PSC Chair

Member

LI Yongjun	Director	Forest Resource Management Office, Forestry Department of Anhui Province
SUN Shousheng	Director	International Cooperation Office, Forestry Department of Anhui Province
WANG Li	Director	Chizhou Forestry Bureau, Forestry Department of Anhui Province
WANG Cunlong	Chief	Qingyang Forestry Bureau, Forestry Department of Anhui Province
YE Sinian	Director	Forest Resource Office, Forestry Department of Zhejiang Province
ZHOU Jun		Lin'an Forestry and Agriculture Bureau, Forestry Department of Zhejiang Province
JIANG Chunqian	Professor	Research Institute of Forestry, Chinese Academy of Forestry

5.3 Project management office (PMO) and team

Project management office (PMO) will be formed by a project director and other two assistants

and supported by technical teams for project execution. JIANG Chunqian, who is the project director, is responsible for project arrangement on the general basis, coordination of project implementation in Lin'an and Qingyang, and also for daily contact with the Secretariat of APFNet.

The project team consists of governmental officials and technical experts from Chinese Academy of Forestry, Anhui Province Forestry Administration, Chizhou City Forestry Bureau, Qingyang County Forestry Bureau, Zhejiang Province Forestry Administration and Lin'an County Forestry Bureau. Besides, PMO will invite experts to design project strategies and guide training activities. List key personnel and their roles and responsibilities see the Annex C.

Site project management office (SPMO) will be established in Lin'an and Qingyang to implement and monitor activities in the field.

5.4 Project Execution Agencies

5.4.1 Research Institute of Forestry, Chinese Academy of Forestry

Research Institute of Forestry (RIF) is the earliest founded research institution in Chinese Academy of Forestry (CAF), which has the complete subject setting and the best capacities in science and technology. It has strong comprehensive research capacities in domestic and overseas relevant fields.

China Forestry Sustainable Management and Development Research Center is also at RIF. RIF is a technical support institution for the international forest issue negotiation delegation and UN climate change negotiations. It has the team participating in Montreal Process and international forest issue negotiations for years. It brings forward agreement performance countermeasures for China responding to climate change negotiations and international forest issues. It plays an important role in research on SFM and UN climate change negotiations.

5.4.2 Project Implementation partners

(1) Qingyang County Forestry Bureau

Qingyang County Forestry Bureau has some foundation and experience in management and operation of international cooperation projects. It operated the fast-growing high-yielding forest project from 1985 to 1990, the project of national forestation with World Bank loans, the forest resource development and protection project, the forestry development project in poverty-stricken areas and other forestry development projects from 1991 to 2007, and the second phase of the China-German cooperation project of forestation in Anhui Province from

2002 to 2012. Besides, it operated the Yangtze River reservation forest project with national debts respectively in 1998 and in 2014 and the project of conceding farmland to forest from 2002 to 2011, and the first bamboo science and technology demonstration park was successfully constructed in Youhua Town, Qingyang County, from 2014 to 2015. Operation of these major forestry engineering and construction projects do not only increases backup forest resource volume and improves the unit productivity of forest land but also helps in learning and accumulating advanced project management experience. Qingyang County Forestry Bureau was commended as Outstanding Units of Project Operation by the former Ministry of Forestry, the State Administration of Forestry and Anhui Province Forestry Administration.

(2) Lin'an County Forestry Bureau

Lin'an County is one of the first units undertaking sustainable forest management demonstration initiated by the State Administration of Forestry. It has solid practice foundation in sustainable forest management. Since 1990s, Lin'an County Forestry Bureau introduced some international cooperation projects related to forest management, for instance, the project of Comprehensive Research on Technical, Social and Economic Means in Degraded Forest Land Upgrading (1995-1998) with financial supports jointly from the Center for International Forestry Research (CIFOR) and Canada's International Development Research Center (IDRC), the China (Lin'an) Model Forest Project (from 1999 to now) managed by International Model Forest Network--Asia-Pacific Region (based in Beijing) with financial supports from the Secretariat of International Model Forest Network (based in Canada), the national project of Demonstration on Sustainable Forest Management (from 2005 to now), and the China Green Carbon Fund - PetroChina - Zhejiang Lin'an Moso Bamboo Carbon Sink Project (initiated in 2008) which is one of the first ten national carbon sequestration forestation projects with such supports and the first of its kind in China and even in the world. In the meantime, Lin'an County also organized and launched plenty of training and promotion activities in sustainable forest management. Over the recent five years, the Forestry Executive Leadership Academy of the State Administration of Forestry, the International Network for Bamboo and Rattan and the Bamboo Center of the State Administration of Forestry, jointly with Lin'an County Forestry Bureau, organize international technical training in sustainable forest management for three to four times, which involves more than 4000 person-times and 40 countries including Thailand, Burma, Philippines, Chile, etc. and the content of which contains sustainable management in Mountainous Areas, Use of Non-Wood Forest Products, Processing and Development of Bamboo Products, etc.

Lin'an County Forestry Bureau has accumulated plenty of experience and mastered forest multi-purpose management technologies based on long time scientific research and working practice. Lin'an County has developed a long term scientific research partnership with Chinese Academy of Forestry and other scientific research academies and institutes, and Zhejiang A&F

University and other colleges and universities, in long time participation in domestic and international projects, which boosts solid foundation in cooperation. In particular, Zhejiang A&F University is located in Lin'an County, which is the sole provincial university of agriculture and forestry in Zhejiang Province. It has remarkable features in such research fields as climate change, forest restoration and sustainable forest management.

Lin'an County Modern Forestry Science and Technology Service Center is a support unit for the international demonstration forest network and keeps being a scientific and technological education and training base of the Ministry of Science and Technology, which is a non-governmental organization. All of the mentioned above provide scientific research and technical supports for Lin'an in implementing the project of sustainable forest management and restoration network.

5.5 Communication

The project management office (PMO) is set up at Chinese Academy of Forestry and submits the semi-annual progress report and the detailed annual report to the project management agency, planning on project operation and field inspection, and assisting in facilitating exchange and information sharing. Project site management offices (SPMO) are responsible for specific project operation and arrangement in local sites.   PMO and SPMO will follow close to the line of the APFNet regulation and contract.

PMO and each SPMO will hold regular project progress seminars via email, Wechat and progress brochure, and submits the semi-annual progress report and the detailed annual report to ensure the information sharing and objectives to be achieved. They will still keep in touch with the project steering committee. PMO will use twice internal evaluation (one is the interim report evaluation and the other is the terminal report evaluation) to review project progress.

All above activities will ensure the objectives to be achieved. Communication strategy detailed see the Annex C-3.

5.6 Reports submission

RIF/PMO is responsible for taking lead in project documents submission in line with *APFNet PIIM (2013)*. Submission of following documents is required to keep APFNet updated on project progress and grant disbursement in a timely manner:

(a)First Annual Work Plan (AWP1) should be submitted within 30 days since the entry into force of this Agreement; subsequent Annual Work Plan(s) should be submitted at least 30 days before the commencement of the Project year(s);

(b)Semi-annual Progress Report(s) in the middle of each Project Year should be submitted within 20 days since the end of each reporting period;

(c)Annual Progress Report(s), Annual Financial Report(s), mid-term Audit Report should be submitted within 30 days since the end of the reporting period; and

(d) Project Completion Report (PCR), Final Audit Report, and other supporting documents as required within 45 days after the project implementation.

6. Project resources and financial management

The project is budgeted with USD 1,410,207 of which USD695, 207 is specially granted by APFNet and the other USD 715,000 is from local supporting. Please refer to Annex E for details.

The project budget (*Annex E-3_ Detailed information of project budget*) is implemented in accordance with China's regulations and APFNet's requirements on project financial management.

APFNet grant will be disbursed in 5 installments directly to RIF's bank account upon submission and approval of the Annual Work Plans. RIF is responsible to disburse APFNet grant to the IAs' bank accounts according to the approved Annual Work Plans.

The project accounts for EA and IAs shall be audited by an independent audit firm proposed by EA in consultation with APFNet on an annual basis.

The Project account is closed upon the completion of the Project, and the IAs shall not incur any expenditure from the grant. The balance of funds remaining available under the APFNet grant shall be elaborated in the Financial Statement.

The EA and IAs shall provide the official invoice upon the receipt of the allocated fund to APFNet.

7. Monitoring and evaluation

Internal monitoring and evaluation

Internal monitoring and evaluation will be completed regularly in order to ensure the efficiency and effectiveness of project implementation, to achieve the ultimate project objectives, to avoid encountering unexpected delays in such areas as output delivery, and to ensure the timing and actual availability of planned input items (e.g., personnel, equipment, funds). Internal monitoring and evaluation will be completed by the PSC and EA through evaluation of regular progress

reports. PMO should monitor and evaluate project implementation at each project site.

External monitoring and evaluation

Two external evaluations of the project will also be conducted by an independent consultant hired by APFNet. A midterm evaluation and terminal evaluation, including evaluation meetings with the consultant at EA and IAs will be held at the end of the second project year and within two months after project completion.

8. Dissemination, duplicability and sustainability

8.1 Dissemination and knowledge sharing

Update electronic news, report project progress and share views on issues with common concern on the quarterly basis. In addition, report to APFNet on project progress, experience and lesson. Project sites will endeavor to make local newspapers and TV stations disseminate information at the local level. Besides regular updates and reports, every project site will create a compatible project thematic map document which contains essential information as follows: its geographic location, a brief description, its status quo and its impact, at least one photo and others. Such information will be available to the public on the Google Maps.

Best practice will be filed by means of Systemization which does not only record experience and lesson but also results and the process (of how we get such results). The process of recording and filing is very important, which sets an example for other project sites.

8.2 Project sustainability

In order to guarantee follow up activities after project conclusion, project sites should include the local community and other stakeholders in the neighborhood in the project plan, for example, taking into consideration demands of other stakeholders in the neighborhood, taking them in for technical training and for suggestion survey on project operation. When consideration is given to other stakeholders in the course of project program design and operation, they will make joint efforts with stakeholders in project areas, thus, reducing conflict and providing continuous and stable guarantee in interest and participation of all the parties. Land owners lose rights of their lands (to farming, tourism or other relevant activities) for project use. Sign written contracts with land owners, ensuring such lands not to be sold or used for other purpose, relieving conflict with land users.

As part of daily work, the project management office and project sites should cooperate with governments of various levels and other partners in incorporating forest restoration into present

and future plans. Taking Lin'an County for example, at the local level, the government is responsible for accreditation of demonstration sites and cooperating scientific research institutions are responsible for collecting data, while at a higher level, APFNet, as an international organization, on one hand, shares project achievements with other member countries and regions, especially, sharing such project achievements in forest restoration with other Asia-Pacific member countries and regions, and on the other hand, APFNet launches exchange activities with other international organizations to explore future potential cooperation in this project and thus further expand the project.

Annex A: Project sites map and relevant information
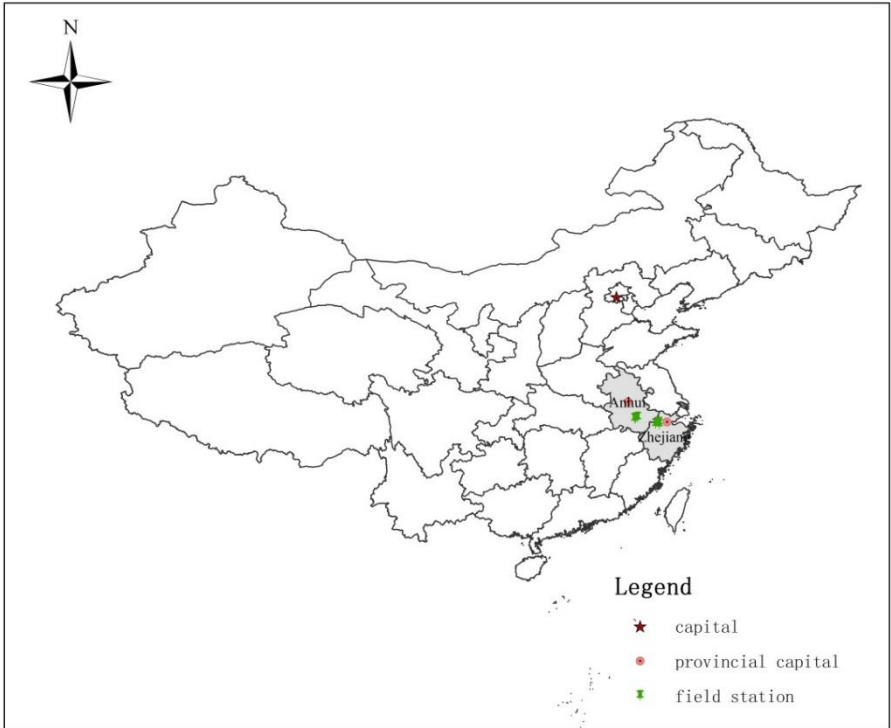
Picture 1 Project sites in China
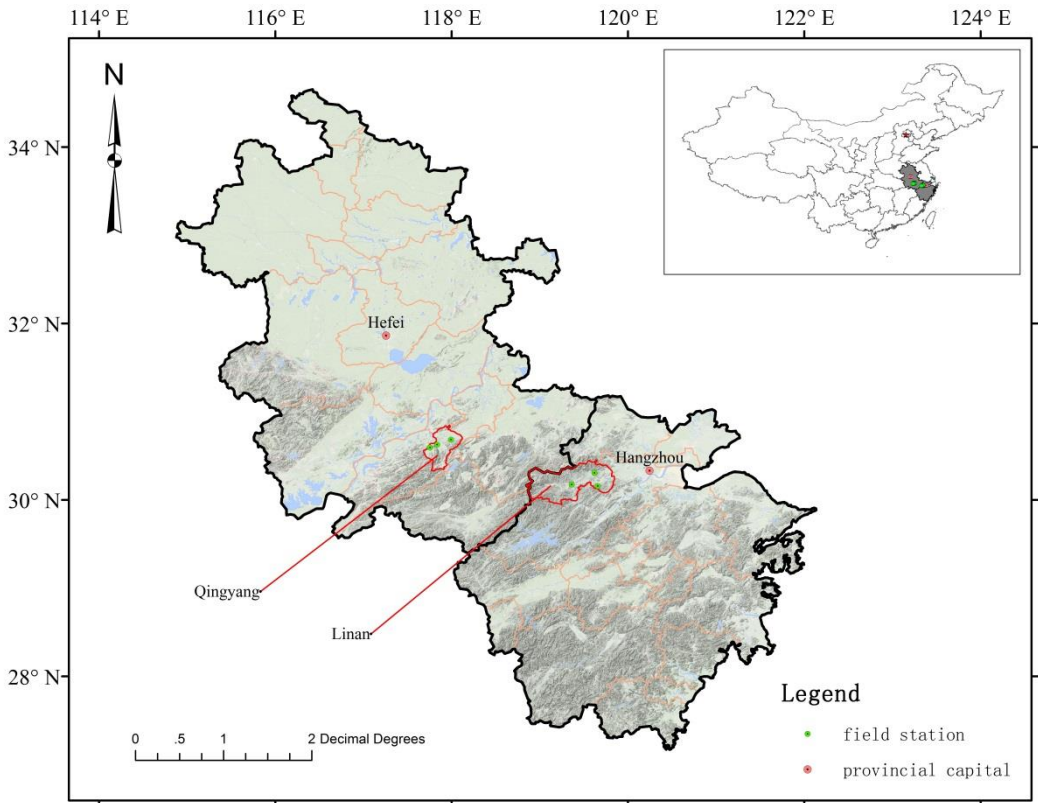
Picture 2 Project Sites in Anhui Province and Zhejiang Province

Annex A: Project sites map and relevant information
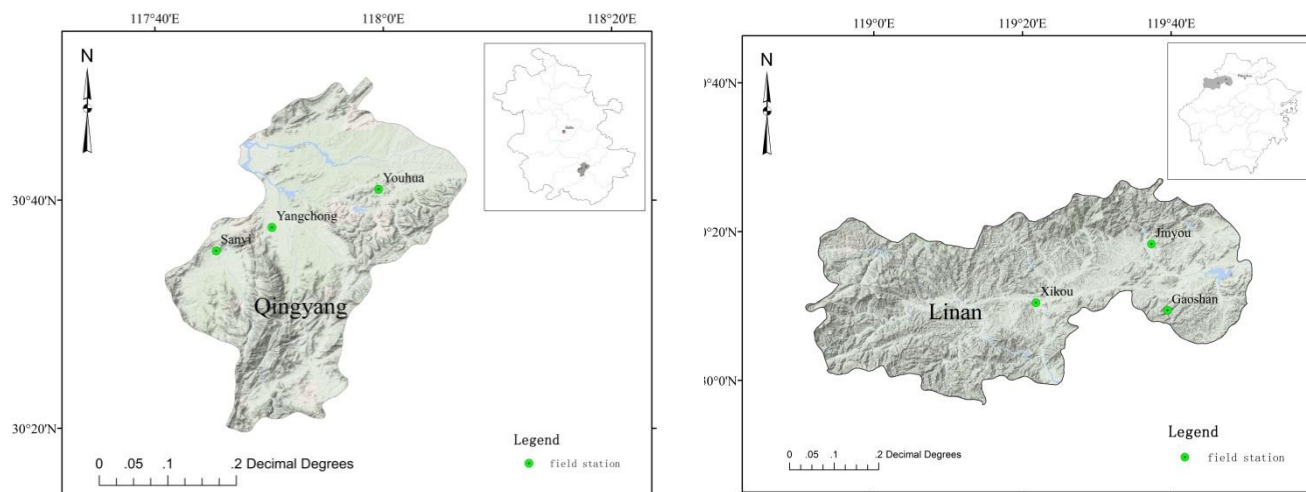
Picture 3 Project Sites in Qingyang County and Lin'an County

1. Qingyang County, Anhui Province

Qingyang County of Anhui Province is situated at mid- and downstream areas of the Yangtze River and Huaihe River. It is the hinterland of the Yangtze River Delta. It is one of the key forestry zones in Anhui Province. (Pictures 1 and 2) The total land area of Qingyang County is 114,000 hectares of which 17,000 is cultivated land and 70,000 is forestry use land. As the saying goes, "seven tenths is for mountains, one tenth is for waters, one tenth is for farmland and the last one tenth is for fincas." The area of forested land covers 64,500 hectares. The forest volume is 4.24 million m³.

The project sites in Qingyang County are Yaoxi Forest Farm in Sanyi Village, of Miaoqian Town, Yangchong Village of Rongcheng Town and Youhua (consisting of Youhua Forest Farm and Huaan Village). Please refer to the left part of Picture 3.

2. Lin'an County, Zhejiang Province

Lin'an County is situated in the northwest of Zhejiang Province, with Hangzhou City in the east and the Mount Huang in the west. It is the only key forest zone county in the Yangtze River Delta, which is adjacent to Shanghai, Hangzhou and other large or medium sized cities. It is the source region of the river system of the Lake Taihu and the Qiantang River. It is a significant ecological protective screen in the north of Zhejiang Province. It also serves as a significant source of superior quality water supply to the Hangjiahu region. The number of its total population is 520,000 of which 85% is the agricultural population.

Lin'an County has abundant forest resources. It is the only one in China admitted into the International Model Forest Network and experimental carbon sink forest areas. Its total land area is 313,477.5 hectares of which the forestry use land is 260,700 hectares. Its forest volume is 9.939 million m³.

The project sites in Lin'an County are Xikou Village of Yuqian Town, Jinxiu Village of Taihuyuan Town and Gaoyuan Village of Linglong Street Town. (The right part of Picture 3).

Annex A: Project sites map and relevant information

Basic information of project sites

NO.	Project Activity No.	Name of the site (province – city – district village)	Accessibility *	Total area （hm²）	Forest area(hm²)	Growing stock (m3)	Forest cover rate(%)	Population	Agricultural population	Area of project activity(ha)	Major indigenous tree species	Note
1	1.4.1.1 Degraded forest restoration in Youhua state forest	Youhua State Forest Farm,Youhua town, Qingyang county	28 km from the east of county (30 minutes' drive)	3821.5	2925.4	205711	76.55	15000	15000	30	Platycladus orientalis （L.) Franco, Pteroceltis tatarinowii Maxim,Pistacia chinensis, Oriental arborvitae, Erythrina	Changbu
2				3821.5	2925.4	205711	76.55	15000	15000	20	Chinese fir,Sweetgum,Celtis sinensis,sassafras albidum	Caoxieling
3	1.4.1.2 Large-diameter-oriented cultivation of Chinese fir in Yaoxi Forest Farm	Sanyi Village, Miaoqian Town, Qingyang county	10 km from the west of county (20 minutes' drive)	1028.0	7561.1	50838.3	44.42	2710	2710	15	Chinese fir,Schima superba Gardn. et Champ.	
4	1.4.1.3 Intensive management of bamboo forest	Xifengling, Yangchong Village, Qingyang County	5 km from the west of county (10 minutes' drive)	870.0	533.3		61.30	2700	2700	20	Moso bamboo;Chinese fir,Masson pine	
5	1.4.1.4 Design planning on control of pine wilt disease and protection of migratory birds	Baihua Village, Qingyang County	5 km from south of county (10 minutes' drive)	1060.0	467.0		44.03	3921	3921	15	Masson pine,Chinese fir, Sweetgum,	
6	1.4.2.1 Landscape restoration on degraded second forest	Xikou Village,Lin'an	38 km from the west of county ; 130 km from Hangzhou Xiaoshan airport (2.5 hours' drive)	596.0	253.3		42.51	1327	1327	30	Quercus	
7	1.4.2.2 Muti-purpose restoration and management of degraded forest land	Gaoyuan Village, Lin'an	18 km from the west of city; 115 km from Hangzhou Xiaoshan，airport (2 hours' drive)	1313.5	921.8		70.18	1567	1567	10	Quercus,Torreya,(crop)	
8	1.4.2.3 Restoration and sustainable management of degraded Chinese fir plantation	Jinxiu Village, Lin'an County	13 km from the west ofcounty ; 110 km from Hangzhou Xiaoshan airport (2 hours' drive)）	840.0	588.0		70.00	2149	2149	20	Sassafras,Chinese fir	

Qingyang County is 28 km from Jiuhuashan airport, 20 minutes' drive

Annex A: Project sites map and relevant information

Compartment and sub-compartment information

Project Activity No.	Name of the site	No. of the compartment	No. of the subcompartment	Soil type	Soil depth (cm)	Altitude (m)	Direction of slope	Gradient	Annual precipitation (mm)	Major wind direction	Stand age(a)	DBH (cm)	height (m)	Major historical tree species
1.4.1.1 Degraded forest restoration in Youhua state forest	Youhua State Forest Farm,Youhua town	Changbu	1	Yellow soil	30—45	300	Northeast	18	1600-1800	Northeast,North	12	6	4	Platycladus orientalis （L.) Franco, Pteroceltis tatarinowii Maxim,Pistacia chinensis,
	Youhua State Forest Farm,Youhua town	Jiangkengxipai	3	Yellow soil	30—45	300	East	20	1600-1800	Northeast,North	14	10	8	Chinese fir,Sweetgum,Celtis sinensis,sassafras albidum
1.4.1.2 Large-diameter-oriented cultivation of Chinese fir in Yaoxi Forest Farm	SanyiVillage, Miaoqian Town	Nanwa	1	Yellow soil	60—100	180	South	21	1600-1800	Northeast,North	18	14.3	11	Chinese fir,Schima superba Gardn. et Champ.
		Qiaowa	2	Yellow soil	60—100	90	Southeast	15	1600-1800	Northeast,North	17	13.8	10	Chinese fir,Schima superba Gardn. et Champ.
1.4.1.3 Intensive management of bamboo forest	Yangchong Yangchong Village,Rongcheng Town	Xifengling	36	Yellow soil	50—80	200	North	20	1600-1800	Northeast,North	14	16	14.5	Moso bamboo,Chinese fir
			37	Yellow soil	50—80	200	West	20	1600-1800	Northeast、North	14			Moso bamboo,Chinese fir
			38	Yellow soil	50—80	200	North	20	1600-1800	Northeast,North	14	16	14.6	Moso bamboo,Chinese fir
1.4.1.4 Design planning on control of pine wilt disease and protection of migratory birds	Baihua Village,,Rongcheng Town	Baihua	4\14\26\39\53	Yellow soil	40—80	200	North	15	1600-1800	Northeast,North		18	13.5	Chinese fir, Sweetgum, Masson pin
1.4.2.3 Restoration and sustainable management of degraded Chinese fir plantation	Jinxiu Village,Taihuyuan Town	Xibianshan	1	Red soil	40—75	260	Southeast	30	1600	East,Northeast	13			Chinese fir
1.4.2.3 Restoration and sustainable management of degraded Chinese fir plantation	Jinxiu Village,Taihuyuan Town	Waiwan	2	Red soil	40—70	260	Southeast	30	1600	East,Northeast	13			Chinese fir
1.4.2.1 Landscape restoration on degraded second forest	Xikou Village,Yuqian Town	Ganzhewu	10	Red soil	40—80	400	Northeast	35	1600	East,Northeast	20			Chinese fir,Moso bamboo
			11	Red soil	40—80	400	Northeast	35	1600	East,Northeast	20			Chinese fir,Moso bamboo
1.4.2.2 Muti-purpose restoration and management of degraded forest land	Gaoyuan Village, Longlong	Yinjian xia	91	Red soil	50—100	200	North	30	1600	East,Northeast	14			Chinese fir
		Huangshanshang	96	Red soil	50—100	200	South	30	1600	East,Northeast	14			Chinese fir

Annex B: Project logical framework

|		Intervention logic	Objectively verifiable indicators of achievement	Sources of information and means of verification	Assumptions
Goal(s)		The general objective of project is to promote restoration and sustainable management of forest which focus on the improvement of forest ecosystem productivity and forest carbon storage in hilly area of Southern China. It is anticipated to bring forward forest restoration technologies and organizational management models. The results are expected to enhance both technological and management capacities of hilly areas of Southern China in sustainable forest management and restoration, improve the quality of forest, increase forest carbon storage, improve living standards of local residents in the forest zone and thus set an example for its kind in the Asia-Pacific region in future.	Ecological indicator: improvement in forest quality and increase in carbon storage; Economic indicator: betterment of residents' living standards; Other indicators: formulation of forest carbon accounting methods; and promotion of influence of achievements.	Project Agreement Project Document Annual work plan and progress report Project completion report Audit report	Project fund disbursed timely; Active cooperation and duty fulfillment by project participants and partners; and Scientific and reasonable information and data.
Decomposed Objectives		(1) Developing and demonstrating effective technological methods and strategies of SFM and restoration at landscape level; (2) Establishing the carbon accounting methodology for SFM and restoration at the project level; (3) Promoting knowledge and experience exchange in SFM and restoration among Asian-Pacific region.	Report on types of forest degradation and needs assessment; Demonstration areas (160ha) ; Strategy and work plan of SFM and forest restoration; Carbon accounting methodology ; and The number of trainees and participants to attend the workshops and field studies (400).	Annual work plan and progress report; Field interview and workshops; Training courses and materials; Project strategy and work plan; Forest carbon storage and sink accounting based on field investigation and survey and regular monitoring; and Participants' reports to the international conference.	
Expected Outputs Output 1		Demonstration on sustainable forest management and restoration	The area for demonstration; and Work design programs.(160ha)	Annual progress report Maps of project areas; Ecological monitoring data acquired from field investigation; and Strategies/programs on sustainable forest management and restoration.	Active cooperation and duty fulfillment by project participants and partners; and With detailed forest inventory data and feasible rehabilitation plans available
Activities		Activity 1.1 Set up sample plots and controls Activity 1.2 Surveying background data in project sites Activity 1.3 Designing operation plans on forest restoration and management for demonstration sites Activity 1.4 Implementing the operation design plan Activity 1.5 Developing strategies of SFM and restoration 1.5.1 Field activity in Qingyang 1.5.1.1 Degraded forest restoration in Youhua State Forest Farm	60 hectares in Lin'an County and 100 hectares in Qingyang County; Strategy and work plan of SFM and forest restoration;	Maps of project areas and image information on field work; and Report on data information from field investigation and regular monitoring Forest rehabilitation strategies and sustainable management; Work design programs as formulated; and Mid-term progress report.	

	Intervention logic	Objectively verifiable indicators of achievement	Sources of information and means of verification	Assumptions
	1.5.1.2 Large-diameter-oriented cultivation of Chinese fir in Yaoxi Forest Farm 1.5.1.3 Intensive management of bamboo forest 1.5.1.4 Design planning on control of pine wilt disease and protection of migratory birds 1.5.2 Field activity in Lin'an 1.5.2.1 Landscape restoration on degraded second forest 1.5.2.2 Multi-purpose restoration and management of degraded forest land 1.5.2.3 Restoration and sustainable management of degraded Chinese fir plantation Activity 1.6 Monitoring and evaluating the effect of restoration			
Expected Outputs Output 2	Accounted Forest Carbon Storage and Sinks in Target Areas	Ecological monitoring indicator and report. Carbon sinks results; Carbon accounting methodology	Project progress report; Carbon storage reports; and Carbon sinks in project areas.	Detailed investigation on sample sites and regular monitoring data; and Complete historic statistical data on forest resources
Activities	Activity 2.1 Analysing baseline data of carbon pools of project sites Activity 2.2 Collecting dynamic data on forest carbon storage at project sites Activity 2.3 Establishing FRLs and accounting of carbon sinks at project sites Activity 2.4 Developing the carbon accounting methodology at project level which could be applied in the subtropical forest area of Southeast Asia.	Field ecological monitoring data (including biomass data and monitoring data on key carbon emission sources); Forest carbon storage and sinks in demonstration areas; and Accounting and monitoring methodology in forest rehabilitation projects.	Regular information analysis reports on monitoring data and historical statistical data; Reports on forest carbon storage and sinks in demonstration areas; and Forest rehabilitation carbon accounting methodology (forest reference levels).	
Expected Outputs Output 3	Enhanced Capacity Building and Information Sharing among the Stakeholders	The number of training workshops(4times); The number of trainees and participants to attend conferences and field study (400 people).	Annual progress report Training workshop reports; Meeting minutes; and Media reports.	Effective training could improve the capacities of the stakeholders
Activities	Activity 3.1 Holding project inception workshop and 1st steering committee for program implementation Activity 3.2 Building capacity via training on relevant knowledge and techniques Activity 3.3 Exchanging regularly and attending international conferences Activity 3.4 Publishing project results	Communication information; The number of training workshops (4 times); The number of trainees and participants(400); The number of attending international conferences(about 9 people/times) ; Interim progress workshop; The number of publication (1).	Email reports and project progress reports; Training martials and minutes; Report on attending international conferences and visit; Final reports and audit report; and Publications.	

Annex C: Project management structure and communication mechanism chart(s)

AnnexC-1:
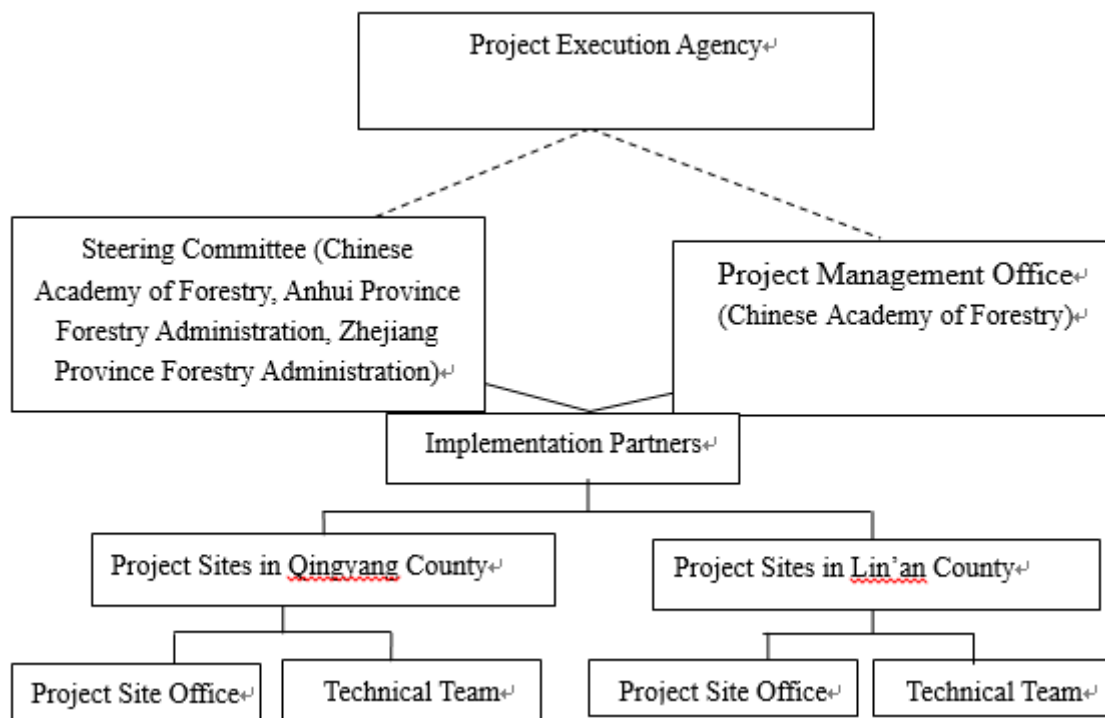
(1) The project execution agency is Research Institute of Forestry (RIF), in Chinese Academy of Forestry, which is responsible for general operation and providing technical service to project sites;

(2) The project management office is set in Chinese Academy of Forestry which is responsible for communication between the project execution agency and APFNet, communication and coordination between the project execution agency and project implementation partners, and supervision on and management of project operation progress and fund use.

(3) The project steering committee consists of technical experts from Chinese Academy of Forestry, Anhui Province Forestry Bureau, Zhejiang Province Forestry Bureau, which provides technical guarantee in project operation, and necessary technical supports for project implementation partners in technical training, the expert steering committee, and others.

(4) Project site offices are set in Qingyang County Forestry Bureau and Lin'an County Forestry Bureau respectively, and make sure of smooth project operation. Each project site office (SPMO) will be responsible for supervising launching of local project activities, providing supports for project technical experts, and at the same time purchasing and managing equipment for that project site in compliance with project fund use management methods. It is required that there be at least one forestry expert in the project site office staff.

(5) A project site consists of an office and a technical team. The project site office manager is as appointed by the local Forestry Bureau. The project site office is responsible for specific project operation and arrangement in Qingyang County and Lin'an County and reporting on project progress regularly to the project management office.

The staff in PMO and SPMO see Annex C-2.

Annex C: Project management structure and communication mechanism chart(s)

Annex C-2 PMO and SPMO staff

1. **RIF**

   (1) Dr. **JIANG Chunqian**, Project Steering Committee representative and National Focal Point for Lin'an Model Forest.

   Under this project, Dr. Jiang will take charge of the whole project's implementation, management and reporting under the support of the partners and research teams in Lin'an and Qingyang.

   jiangchq@caf.ac.cn   010-62889093

   (2) Dr. **BAI Yanfeng** will be responsible for the project's coordination and implementation, technology training, and capacity building.

   baiyf@caf.ac.cn 010-62889094

   (3) Dr. **LIU En** will be responsible for the project's field activities and financial management including financial report. liuen1983@163.com 010-62889267

   (4) Ms. **QU sheng**, will be responsible for the file management.

   Qusheng@caf.ac.cn 010-62889622

2. **Lin'an FB**

   (1) Mr. **ZHU Yongjun**, will be responsible for the project progress report in Lin'an.
   13516728136

   (2) Mr. **TANG Mingrong**, Eng.

   Under this project, Mr. Tang will be responsible for the daily management of the project office, the field planting, maintaining, and data collection in the field, in Lin'an. 13506816732

   (3) Mr. **WANG Anguo** will be responsible for the capacity building, technical extension, and technology distribution to farmers. 13588234551

3. **Qingyang FB**

   (1) Mr. **LI Tongshun** will be responsible for the field planting, maintaining, data collection in the field and project progress report in Qingyang. 13965926768

   (2) Mr. **CHENG Suiping** will be responsible for the field planting, maintaining, and data collection in Youhua forest farm

Annex C: Project management structure and communication mechanism chart(s)

Project Team

No.	Name	Institution	Technical Field/Specialty	Job Description (Duties)
1	Jiang Chunqian	Chinese Academy of Forestry	Forest cultivation and sustainable management	Project director, responsible for project operation and coordination on the general basis and reporting to APFNet.
2	Bai Yanfeng	Chinese Academy of Forestry	Sustainable forest management and forest carbon cycle	Project technical assistant and carbon sink accounting
3	Liu En	Chinese Academy of Forestry	Forestry ecology	PMO administration staff, Responsible for project financial affairs（including financial report）and carbon sink accounting
4	Wang Li	Chizhou City Forestry Bureau, Anhui Province	Forestry	Responsible for coordination with project sites in Qingyang County
5	Wang Cunlong	Qingyang County Forestry Bureau, Anhui Province	Forestry	Manager of project sites in Qingyang County, responsible for project activity design and arrangement on the general basis.
6	Li Tongshun	Qingyang County Forestry Bureau, Anhui Province	Forestry and Ecology	Technical leader of project sites in Qingyang County, responsible for operation of and technical guidance in specific programs and also for policy survey and study，including project progress report in Qingyang.
7	Liu Jianzhong	Qingyang County Forestry Bureau, Anhui Province	Forestry	Responsible for providing training in large size timber cultivation.
8	Xie Xiaoting	Qingyang County Forestry Bureau Anhui Province	Forestry	Responsible for providing training in forest restoration and management technologies and also for survey of local data
9	Huang Guoqing	Chizhou City Forestry Bureau, Anhui Province	Forestry	Responsible for policy survey and study and also for providing training in sustainable forest management technologies

Annex C: Project management structure and communication mechanism chart(s)

No.	Name	Institution	Technical Field/Specialty	Job Description (Duties)
10	Cheng Suiping	Youhua Forest Farm, Qingyang County, Anhui Province	Forestry	Responsible for r survey of and study on local data.
11	Liu Chao'an	Youhua Forest Farm, Qingyang County, Anhui Province	Forestry	Responsible for demonstration area.
12	Zhu Yongjun	Lin'an County Forestry Bureau, Zhejiang Province	Forestry	Manager of project sites in Lin'an County, responsible for project coordination in Lin'an County on the general basis，including project progress report in Lin'an.
13	Tang Mingrong	Lin'an County Forestry Bureau, Zhejiang Province	Forestry	Technical consultant of project sites in Lin'an County, responsible for project coordination in Lin'an County on the general basis.
14	Wang Anguo	Lin'an County Modern Forestry Scientific and Technological Service Center	Bamboo forest management and Chinese torreya cultivation	Technical leader of project sites in Lin'an County, responsible for providing technical training and guidance in cultivation of Chinese firs, bamboo forest and Chinese torreyas.
15	Wang Weiyu	Lin'an County Forestry Bureau, Zhejiang Province	Forestry	Responsible for providing technical training in Chinese torreyas, and survey of local data.
16	Hu Zhuping	Lin'an County Forestry Bureau, Zhejiang Province	Forest cultivation	Responsible for field investigation..
17	Li Lanying	Zhejiang A&F University	Forestry economics and management	Responsible for analysis on the drivers mechanism of forest degradation and policies.
18	Wang Yixiang	Zhejiang A&F University	Sustainable forest management and forest restoration technologies	Responsible for field investigation.

Annex C-3: Communication strategy

Objectives	Target audience	Key message	Communication tools	
			Products/Tools	Media/Channels/Activities
Project objective 1	Developing and demonstrating effective technological methods and strategies of SFM and restoration			
Communication objectives				
Project implementation agencies could design and carry out the plan of SFM and restoration after developing feasible strategies, independently.	Project implementation agencies	Methods and strategies of SFM and restoration at landscape levels can improve the forest quality and forest management capacity of the implementation agencies.	Consultant meetings and discussion.	Field investigation and design the strategy.
Project objective 2	Establishing carbon sink accounting methodology for SFM and restoration at the project level			
Communication objectives				
Government and forest owners should obtain the knowledge and benefits of carbon after finishing the carbon accounting and monitoring.	Government and forest owners	Government and forest owners can present the basic knowledge and how to estimate carbon credit.	Training course and meetings.	Class teaching, and field investigation.
Project objective 3	Promoting knowledge and experience exchange in SFM and restoration among Asian-Pacific region			
Communication objectives				
Forest management agencies and farmers in project areas and in Asian-Pacific region should share the knowledge and experience after international visit and Publications release.	Forest management agencies and farmers	Raise popularity of the demonstration project.	International conference ,website, and academy journal	International conference

Budget for Internationale communication (Activity 3.3)

No.	Nation/Organization	Objective	Date	Person-time	Travel cost （1person/day)	Hotel expense （1person/day)	Board wages （1person/day)	Allowance （1person/day)	Sub-total($)	Description
1	Southeast asia	To learn and participate the experience and lessons	July,2019	7	1835	770	350	245	22400	7days,1 RIF,3 each site
2	USA,UNFCCC/UNFF	To discuss technical regulations to establish the FRLs.	December,2019	1	2585	1715	385	315	5000	7days,1RIF
3	Thailand/Canadian Forest Service	Regional model forest workshop. To report achievements of the project and share the experience of SFM and forest restoration with IMFN.	March,2020	1	2640	1260	330	270	4500	6days,1RIF

Annex F: Detailed implementation plan for Activity 1.4

Activity 1.4.1 Field activity in Qingyang

Activity 1.4.1.1 Demonstration on degraded forest restoration in Youhua State Forest Farm

Purpose and significance: Taking into account the current situation of forest resources managed by the state forest farm and forestry companies, study on how to adjust strategies of restoration of degraded forests to local conditions, and bring forward models and technologies of degraded forest rehabilitation, in order to improve quality of local forest and capacities in forest sustainable management, better abilities and skills of local Forestry Bureau officials, forestry investors, forest workers and forest farmers in forestry management and technologies, and facilitate accomplishment of forest sustainable development objectives.

Location and size: The demonstration site is located in the sub-compartment No. 3 of the western compartment, Caoxieling Forest Management Zone, the area of which is 20.00 hectares and sub-compartment No. 1 of Changbu Forest Management Zone, the area of which is 30.00 hectares.

Stand characteristics: The project sites have a hilly landform, of which the average altitude is 300m, the aspect is east, the slope position is lower, the average slope gradient is 20°, and the bed rock is limestone. Forest stands of the project site are plantations in 2002, of which the average age is12~14 years old, the origin is artificial, and the species consists of six kinds of firs and four kinds of maples. Artificial and natural factors lead to bad forest stand and forest form, poor forest quality, and low benefits and forest land productivity, which, in turn, impede improvement in forest resource quality and sustainable management capacities.

No. of the compartment	No. of the sub-compart ment	Soil type	Soil dept h	Altitu de	Directi on of slope	Gradie nt	Annual precipitat ion	Stan d age(	DB H (c	heig ht (m

Annex F: Detailed implementation plan for Activity 1.4

			(cm)	(m)			(mm)	a)	m)	)
Changbu	1	Yellow soil	30—45	300	Northeast	18	1600-1800	12	6	4
Jiangkengxipai(Caoxieling)	3	Yellow soil	30—45	300	East	20	1600-1800	14	10	8

Detailed implementation approaches and timeframe

(1) 2017.1-6, Collect basic data and carry out the second class investigation.

(2) 2017.7-12, Invite consultants to design the forest tending and management plan.

(3) 2018.1-2020.12, Implement the forest restoration and management plan.

- Upgrade deteriorated forest and low efficiency shrub forest by means of enclosing tending;

- Upgrade such forest stands with good conditions in natural regeneration by means of enclosing for tending while avoiding artificial intervention as much as possible;

- Upgrade forest land with difficulties in natural regeneration by means of artificially forced regeneration, while enclosing tending in compliance with GB/15163-2004;

- Use release cutting, thinning and accretion cutting as main tending methods for deteriorated forest;

- The canopy density is not below 0.6 after forest stand tending.

- Prune. Do pruning in early spring or late fall generally.

(4) 2018-2020, Monitor the indicators of biomass and ecology in each December and January next year.

(5) 2021.1, Finish the completed report.

Annex F: Detailed implementation plan for Activity 1.4

Activity 1.4.1.2 Demonstration on large-diameter-oriented cultivation of Chinese fir in Yaoxi Forest Farm

Purpose and significance: Through large diameter timber tending management, achieve the goal of large diameter timber oriented cultivation of Chinese fir plantation, bring forward models and technologies of large diameter timber oriented cultivation of Chinese firs, improve quality of forest, providing practical experience for accumulation and future wide range dissemination, and reserve large diameter timber for future demand.

庙前镇三义村窑西林场杉木大径级材培育技术示范与推广项目小班示意图

Location and size: The demonstration area is located Yaoxi Forest Farm, Sanyi Village, Miaoqian Town, which is ten kilometers away from the west of Qingyang County.

15 hectares as planned.

Stand characteristics: Half-mature or near-mature Chinese fir forest with evident differentiation in stand individuals on its middle, lower or basin part of such a hillside of which the altitude is below 500m, the humus horizon is over 25cm, the soil thickness is more than 80cm, the site index exceeds 16, and where traffic is convenient, the canopy density of forest stand is above 0.8, and forest stand is quality cloned

plantation or plantation of quality provenance seedling from a national find breed base.
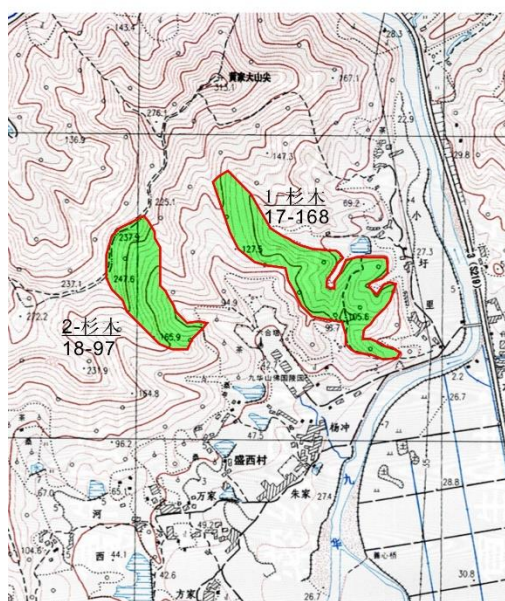
比例尺：1：10000

No. of the compartment	No. of the sub-compartment	Soil type	Soil depth (cm)	Altitude (m)	Direction of slope	Gradient	Annual precipitation (mm)	Stand age(a)	DBH（cm）	height（m）
Nanwa	1	Yellow soil	60—100	180	South	21	1600-1800	18	14.3	11
Qiaowa	2	Yellow soil	60—100	90	Southeast	15	1600-1800	17	13.8	10

Detailed implementation approaches and timeframe

(1) 2017.1-6, Collect basic data and carry out the second class investigation.

Annex F: Detailed implementation plan for Activity 1.4

(2) 2017.7-12, Invite consultants to design the forest tending plan.

(3) 2018.1-2020.12, Implement the forest tending plan.

- Tending pruning: Tending forest stand by removing miscellaneous shrubs across the board and pruning withered branches and twigs.

- Reasonable thinning: Adopting the low thinning method, following the principle of density control prioritized, cutting down such suppressed trees and dying trees of Grades IV and V, felling a small amount of trees of Grade III, basically reserving trees of Grades I and II, that is, "reserving the big while felling the small, reserving the stiff while felling the bent, reserving the single while felling the repeated, and reserving the thin while felling the thick." The workflow is: numbering trees – felling – preparing for concentrated transportation – cleaning forest land.

- Compensatory planting of broad leaf trees: After forest stand thinning, make compensatory planting of rare shade-tolerant broad leaf trees at an appropriate way in early spring, and give the planted nursery stock tending for two times in spring and fall respectively.

- Scientific fertilization: Make band shape, ditch shape or cave shape fertilization to Chinese firs in spring when it is their season of growth, with 50 kilograms of compound fertilizer per mu (that is, 666.67m^2).

- Give such nursery stock of compensatory planting tending two times in spring and fall respectively each year.

(4) 2018-2020, Monitor the indicators of biomass and ecology in each December and January next year.

(5) 2021.1, Finish the completed report.

Annex F: Detailed implementation plan for Activity 1.4

Activity 1.4.1.3 Demonstration on intensive management of bamboo forest

Purpose and significance: Bamboo forests with a reasonable structure, high and stable yield and sustainable management will increase farmers' income, and meet requirements of improving forestry quality and wellfares and sustainable forest management in hilly areas.

Location and size: The demonstration area is located on Xifengling which is in the west of Yangchong Village, Rongcheng Town, and is five kilometers in the west of Qingyang County. Its rea is 20 hectares.

青阳县省级竹子科技示范园规划设计图
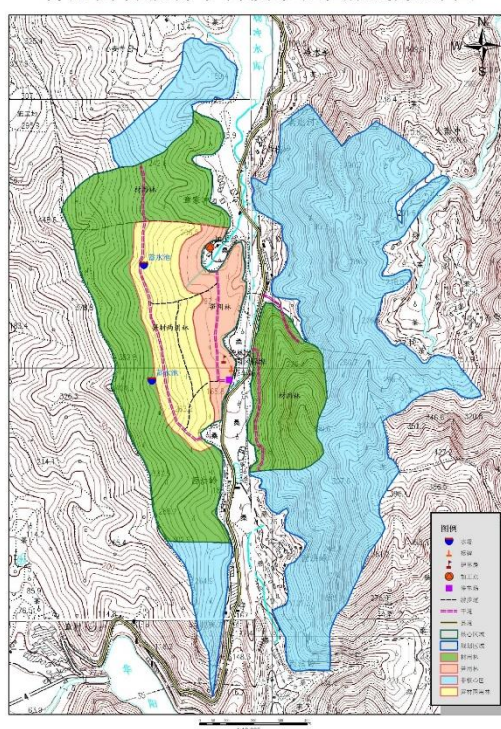
Stand characteristics

No. of the compartment	No. of the sub-compartment	Soil type	Soil depth (cm)	Altitude (m)	Direction of slope	Gradient	Annual precipitation (mm)	Stand age(a)	DBH （cm）	height （m）
Xifengling	36	Yellow soil	50—80	200	North	20	1600-1800	14	16	14.5
	37	Yellow soil	50—80	200	West	20	1600-1800	14		
	38	Yellow soil	50—80	200	North	20	1600-1800	14	16	14.6

Detailed implementation approaches and timeframe

Annex F: Detailed implementation plan for Activity 1.4

(1) 2017.1-6, Collect basic data.

(2) 2017.7-12, Invite consultants to design the bamboo and bamboo shoot management plan.

(3) 2018.1-2020.12, Implement the designed plan.

- Classification Management, Orientation Cultivation

Based on such natural resources as site conditions, traffic conditions and water sources, and such social and economic resources as farmers' capital, labor force and technologies, determine their own target products as appropriate, and thus operate different technical cultivation methods. Make scientific management and classification by specializing 10 hectares as forest cultivation areas for timber use, 5 hectares for such areas for both shoot and timber use and another 5 hectares for such areas for shoot use.

- Production Stimulation Measures by Forest Land Clearing and Tip Bush Hooking

Reclaim bamboo forest land and clear stones, bottom stems and roots. Bush hook the tip appropriately, which works for preventing wind fall and snow crush and making the pole straight and stiff from top to bottom while yielding raw timber and increasing income. Do tip bush hooking generally at the solar term of White Dew, the intensity of which depends on conditions of bamboo forest. Do it in a more intense way on thick and lofty bamboo forest while do it in a less intense way on thin and dwarf bamboo forest. Bush hook the tip as long as not exceeding 1/3 bamboo crown. Reserve at least 15 to 20 joints on each stem.

- Setting up Signs

Set up a main sign at the demonstration park entry and technical measure indictors consistent with management classification and measures.

(4) 2021.1, Finish the completed report.

Annex F: Detailed implementation plan for Activity 1.4

Activity 1.4.2 Field activity in Lin'an

Activity 1.4.2.1 Demonstration on landscape restoration on degraded second forest

Purpose and significance: Long time extensive management of this forest land selected by the project led to degradation of natural secondary forest and gradual decrease in comprehensive forest benefits. Based on the concept of multi-purpose forestry management, this project cultivates tree species of good quality and high efficiency by means of change of tree species to promote the forestry structural adjustment of Xikou Village, yield technical and economic benefits to forest farmers in the neighborhood, make demonstration on forest landscape restoration of degraded forest land in Lin'an County and bring multiple benefits of forest into play.

Location and size: Sub-compartments No. 10 and 11, Ganzhewu, Xikou Village, Yuqian Town, Lin'an County. 30 hectares.
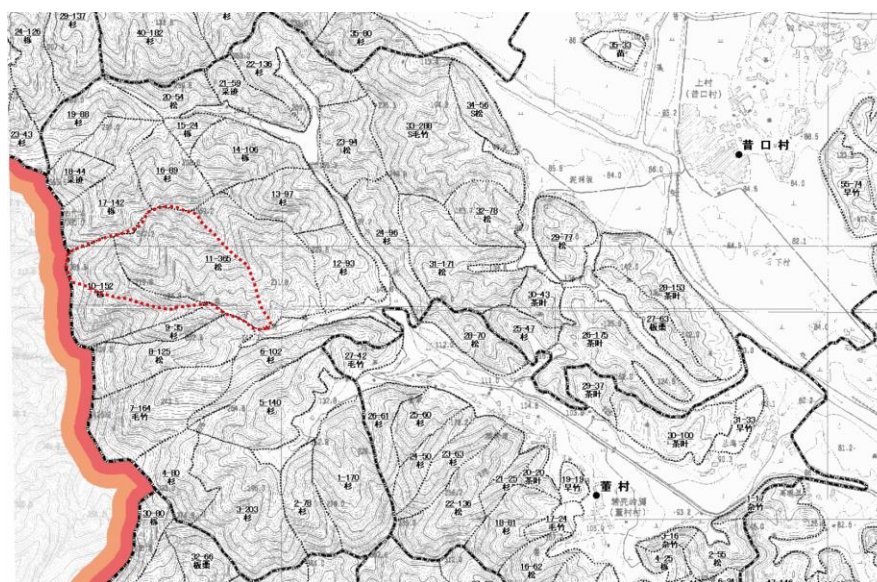
Stand characteristics:

The altitude of 200-300m, and red earth.

No. of the compartment	No. of the sub-compartment	Soil type	Soil depth (cm)	Altitude (m)	Direction of slope	Gradient	Annual precipitation (mm)	Stand age(a)	Major historical tree species
Ganzhewu	10	Red soil	40—80	400	Northeast	35	1600	20	Chinese fir,Moso bamboo
	11	Red soil	40—80	400	Northeast	35	1600	20	Chinese fir,Moso bamboo

Annex F: Detailed implementation plan for Activity 1.4

Detailed implementation approaches and timeframe

(6) 2017.1-6, Collect basic data and carry out the third class investigation.

(7) 2017.7-12, Invite consultants to design the forest restoration plan at landscape.

(8) 2018.1-2020.12, Implement the restoration plan.

- In line with principles of matching tree species with project locations and ecology prioritized while economic benefits considered, enclose the top and ridge of hills for forest tending and do compensatory planting of broad leaf forest trees.

- Make overall land cultivation for soil preparation in such lands with the gradient of below 15°, prepare such lands with the gradient of 15-25° into level terraces or belts, and prepare such lands with the gradient of above 25° into spots.

- Plant Chinese torreyas and other economic tree species and bring ecological, economic and social benefits of degraded forest land into full play.

(9) 2018-2020, Monitor the indicators of increment and ecology in each December and January next year.

(10) 2021.1, Finish the completed report.

Annex F: Detailed implementation plan for Activity 1.4

Activity 1.4.2.2 Demonstration on multi-purpose restoration and management of degraded forest land

Purpose and significance： Deforesting for growing crops led to severe loss of water and soil in this hilly area. Many parts of it became rubbles and barren lands. Only low efficiency crops grow. Upgrade degraded forest land into forest of agro-forestry management by adopting the "Chinese torreya + broad leaf tree species" model and disseminating advanced and updated technologies, in order to improve agricultural efficiency, increase farmers' income and rehabilitate forest landscape.

Location and size： No. 91 below Yinjian, and No. 96 on barren hills, Gaoyuan Village (former Gaoshan Village), Linglong Street Town, Lin'an County.

10 hectares.
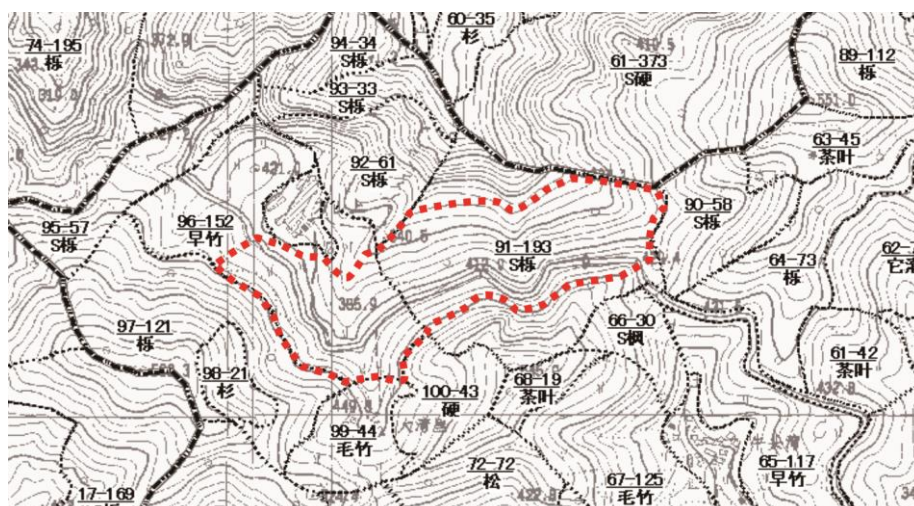
Stand characteristics：

The altitude of 400m, and red earth.

No. of the compartment	No. of the sub-compartment	Soil type	Soil depth (cm)	Altitude (m)	Direction of slope	Gradient	Annual precipitation (mm)	Stand age(a)	Major historical tree species
Yinjian xia	91	Red soil	50—100	200	North	30	1600	14	Chinese fir
Huangshanshang	96	Red soil	50—100	200	South	30	1600	14	Chinese fir

Annex F: Detailed implementation plan for Activity 1.4

Detailed implementation approaches and timeframe

(1) 2017.1-6, Collect basic data and carry out the third class investigation.

(2) 2017.7-12, Invite consultants to design the restoration plan of the degraded forest land.

(3) 2018.1-2020.12, Implement the restoration plan.

In line with principles of matching tree species with project locations and biological mutualism, choose evergreen economic *Chinese torreya* species and deciduous lofty arbor species, adopt integral agro-forestry management technologies, and upgrade degraded forest land into multi-layer ecological economic forest. Details are as follows:

- Making use of existing *Chinese torreya* rootstock and grafting new scions;

- Replacing low efficiency crops by artificial *Chinese torreya*;

- Doing artificially compensatory planting of fast-growing deciduous broad-leaf tree species, including pecans, Chinese tulip trees and the like, inter-planting five to ten trees per mu (that is, 666.67m^2), and facilitate restoration of degraded forest land.

(4) 2018-2020, Monitor the indicators of biomass and ecology in each December and January next year.

(5) 2021.1, Finish the completed report.

Annex G: Field investigation process

Field investigation technical process

Determine project area and boundary	← · — · — · — · →	Based on project objects and local data
Make a field activity plan	← · — · — · — · →	Plots information and investigation content
Recruit investigator	← · — · — · — · →	Field investigation experience
Training classes for field investigator	← · — · — · — · →	Field investigation technical rule and process
Field investigation preparation	← · — · — · — · →	Familiar with local conditions and prepare tools
Field investigation	← · — · — · — · →	To set up the plots, investigate the forest resources, soil and carbon data, and save them according to the standard requirements
Activity data and sample preprocessing	← · — · — · — · →	Enter the data into computer as soon as possible, and preserve the paper documents; sample preprocessing in time. To find and solve the problem of data entry and sample pretreatment.
Activity data and sample analysis	← · — · — · — · →	Data analysis and samples test in a lab.
Results		

Annex H Investigation Forms

Table I-1 Background data in project activity sites

Name of the site:　　　　　　　　No. of sample plots　　　　　　　Date:

No. of site picture：　　　　　　Recorder:：　　　　　　　Investigator:

Site	Province	City（Prefecture）	County（Region）	Township（Town）	Village
Longitude		Latitude		Altitude	
No. of compartment/sub-compartment					
landform and physiognomy	Plain（ ） Hilly（ ） Mountain（ ） Plateau（ ） Basin（ ）				
Climatic type		Mean annual precipitation (mm)		Mean annual temperature (℃)	
Direction of slope	Southeast（ ） South（ ） Southwest（ ） West（ ） Northwest（ ） North（ ） Northeast（ ） East（ ）				
Slope position	Mountaintop（ ） Upslope（ ） Midslope（ ） Downslope（ ） Footslope（ ）				
Vegetation type					
Community					
Canopy density			Community height	m	
Stand age	Plantation（ ）		Young（ ）；Middle-aged（ ）；Near mature（ ）；Mature（ ）；Overmature（ ）		Stand age（ ）a
Human activities	Description	Harvestion（ ） Afforestation（ ） Mowing（ ） Grazing（ ） Fertilization（ ） Traveling（ ） Irrigation（ ） Others（ ）　PS: Detailed description are needed 　Description：			
	Effect intensity	No effect（ ） Light（ ） Moderate（ ） Heavy（ ） Severe（ ）			
Animal activities	Description		Effect intensity	No effect（ ） Light（ ） Moderate（ ） Heavy（ ） Severe（ ）	
Note					

Table I-2 Tree layer investigation

Latitude&longitude:　　　　　　E　　　　　　　　N

Investigator:　　　　　　　　Recorder:　　　　　　　Date:

Sun-compartment	No. of plot （20m×20m）	Plant name	Number	DBH/cm (accuracy: 0.01cm)	Height/m(accuracy: 0.1m)	Coordinate X/m	Coordinate Y/m	Surviving condition		Note
								Living stand	Dead stand	
	......									

Annex H Investigation Forms

TableI-3 Shrub layer investigation

Latitude&longitude: E   N
Name of the site: No. of plot: Plot area:
Total coverage(%):
Investigator: Recorder: Date:

No. of plot （2m× 2m）	Plant name	Quantity	Mean height/cm	Mean basal diameter/cm	Leaf biomass		Branch biomass		Root biomass		Note
					fresh weight/g	dry weight/g	fresh weight/g	dry weight/g	fresh weight/g	dry weight/g	

TableI-4 Herb layer investigation

Latitude&longitude: E   N
Name of the site: No. of plot: Plot area:
Total coverage(%):
Investigator: Recorder: Date:

No. of plot（1m×1m)	Plant name	Quantity	Mean height/cm	Mean coverage/%	Aboveground biomass		Underground biomass		Note
					fresh weight/g	dry weight/g	fresh weight/g	dry weight/g	

Annex H Investigation Forms

TableI-5 Floor litter investigation

Latitude&longitude: E   N

Name of the site: No. of plot: Plot area:

Total coverage(%):   Recorder:

Investigator: Date:

No. of plot（1m×1m）	Floor litter		Note
	fresh weight/g	dry weight/g	

TableI-6 Fallen wood investigation

Latitude&longitude:　E　　　　　　　　N
Name of the site:　　　　　　No. of plot:　　　　Plot area:
Total coverage(%):
Investigator:　　　　　　　　Recorder:　　　　　　　Date:

No. of plot （10m× 10m）	Plant name	Length/m	Middle diameter/ cm	Degree of decomposition			Standing stock		Note
				a.Light	b.Moderate	c.Heavy	fresh weight/g	dry weight/g	

Annex H Investigation Forms

TableI-7 Diseases and pests investigation

Latitude&longitude: E   N

Name of the site: No. of plot: Plot area:

Total coverage(%):

Investigator: Recorder: Date:

No. of sub-compartment	Name of diseases or pests	Quantity/investigation area	Population density/incidence	Damage degree	Control methods and effect	Note

Annex H Investigation Forms

Table I-8 Layer of baseline

No. of beforehand baseline carbon layer	Scattered trees			Herb		Shrub	
	Dominant species	Mean age	Density	Mean coverage	Mean height	Mean coverage	Mean height
BSL-1							
BSL-2							
¼							
BSL-N							

Annex H Investigation Forms

Table I-9 Carbon content of plant and soil

No. of plot:

Sample type □Plant □Soil Date:

No. of analysis	No. of sample	Sample weight/g	Consumption of ferrous sulfare standard solution/ml			Organic matter content/（g/kg）	Total carbon content/	Note
			End	Start	Consumption			

Analyzed by: Checked by: Reviewed by:

Annex H Investigation Forms

Table I-10 Carbon stock change

Compartment No.　　　　Forest type:　　　　　　　Age:

NO.	Activity area(ha)	Carbon stock change					Total carbon stock change (Gg C/yr)	Emissions(Gg CO2e/yr)（Gg C/yr)	CH4
1		Aboveground(Gg C/yr)	Underground(Gg C/yr)	litter(Gg C/yr)	Dead wood(Gg C/yr)	Soil(Gg C/yr)			
2									
3									
…									
Total									

Annex H Investigation Forms

Table I- 11-1 Emission and linkage

Source	Emission （10^3tCO$_{2\ eq}$）	Relative contribution （RC$_{Ei}$）	Accumulative contribution	Key emission source （√）
Emission 1				
Linkage 1				
Emission 2				
Linkage 2				
Emission 3				
Linkage 3				No key emission source
Total				

(Emissions from transport, fuel tools, fertilization and forest fire)

$$RC_{E_i} = \frac{E_i}{\sum\limits_{i=1}^{I} E_i}$$

Where：

RC_{E_i} The relative contribution of the emission of i type GHG emissions (or leakage) to the total emissions of the project

E_i the emission of i type GHG emissions (or leakage)

Table I-11-2 Emissions from transport and operation

	Distance (KM)	Fuel consumption/KM	Fuel /10^3t	Emission/10^3tCO$_{2\ eq}$
Vehicle				
Chain saw				
Tractor				
Pedi cab				
Crane				
……				